

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

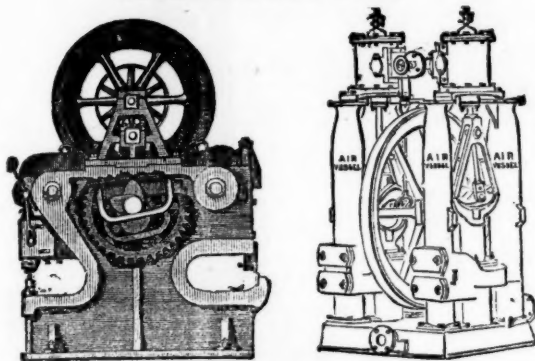
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No. 2270.—Vol. XLIX.

LONDON, SATURDAY, FEBRUARY 22, 1879.

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PARIS,
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,
SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-
ing during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-
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sure was reduced to one-half atmosphere (7½ lbs.), showing
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against the rock—a result of itself indicating many advantages.

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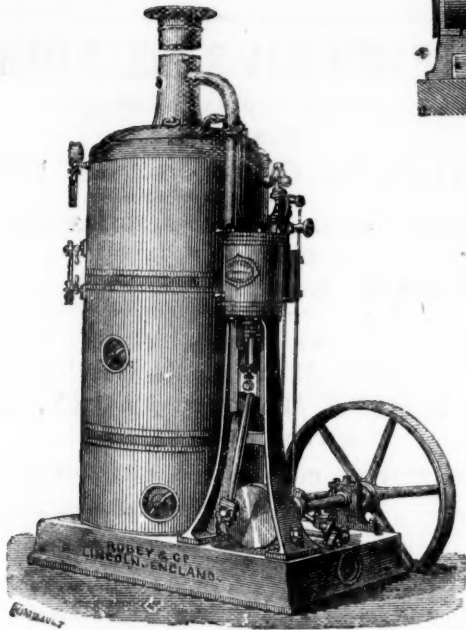
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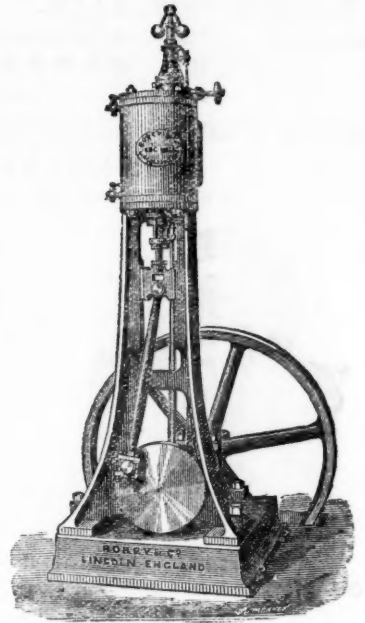
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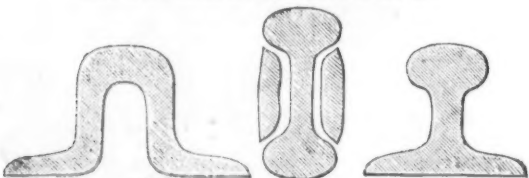
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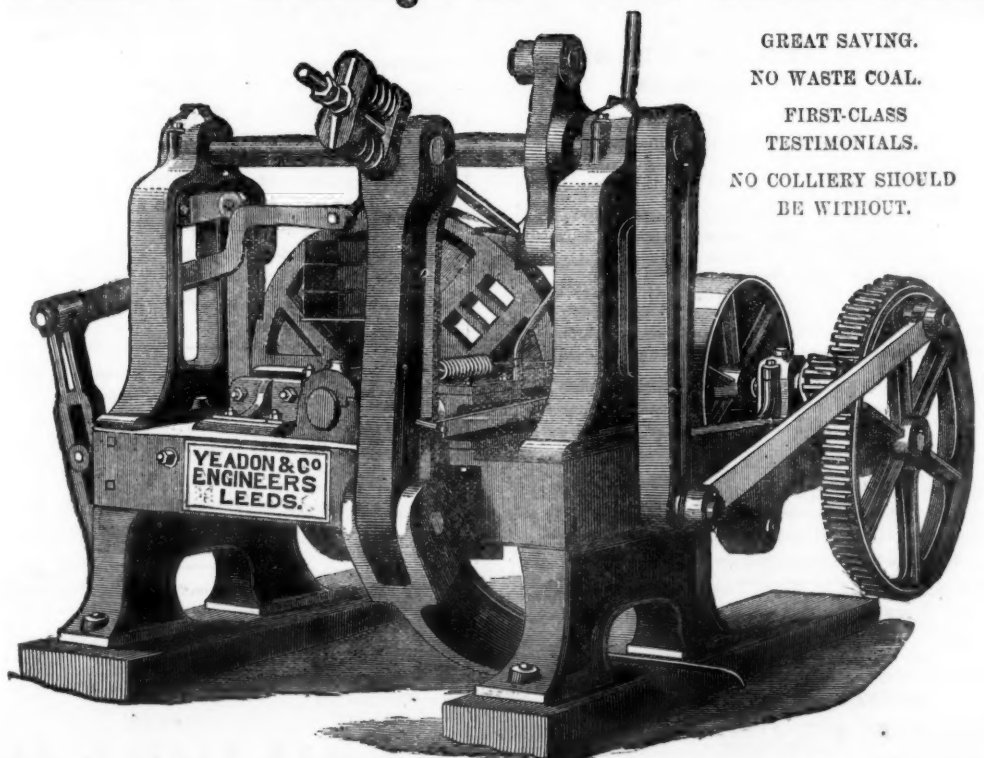
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Original Correspondence.

DREADFUL MINING ACCIDENT IN CHILE.

Sir,—I beg to forward you the following particulars of a fearful occurrence (which I have translated from the Spanish), by which 15 men were buried during nine days, by a fall, in a mine, without food. This happened on Oct. 23, in Chile, at a mine called Las Tortolas, situated near the Mineral of Tamaya, in the province of Coquimbo.

A knowledge of this is worthy of the attention of all those concerned in these kind of works, in which the security of the working miner is, or ought to be, an indispensable consideration. Immediately on those in charge of the mine becoming aware of the nature and extent of the accident, and of the perilous situation of the party thus shut in by this sudden fall of hill, their first idea was that of penetrating as quickly as possible to the part of the mine where it was imprisoned by means of a gallery to be driven through the dead stuff or loose refuse that in immense quantities impeded the egress of the 15 unfortunates, and, at the same time, to facilitate operations by hoisting up through the main shaft to the surface all the dead stuff that might cause delays and hamper their projected workings.

According to the imperfect knowledge that they had of the distance that separated the prisoners from the nearest open and clear working on the mine it was imagined—erroneously as it afterwards appeared—that a gallery of some 3 or 4 yards length, driven horizontally through the loose earth and dead stuff, would be sufficient to reach and extricate the party interred, which view of the case was confirmed by the cries and even the conversation of those imprisoned being audible from the nearest clear working. On this supposition a gallery was immediately commenced through the debris or stuff that filled the intermediate space, by means of planks and joists, supported on stout wooden frames, of 5 ft. by 3½ ft.—that is, 5 ft. in height, by 3½ ft. in width, in what was considered the most likely direction. After 48 hours of constant and unintermitted work they found that they had driven and cleared of all loose stuff a gallery of 6 yards in length, by 3½ ft. by 5 ft. But here they perceived their error after having already driven 2 yards more than their estimate the voices of those within scarcely sounded nearer than when the work was commenced, and they soon became aware that in all probability not less than another 6 yards of gallery would have to be driven.

It had also happened that a working carried on by the imprisoned party to assist in its own liberation had caused a considerable fall of loose stuff from above, which had obliged it to retire farther from its liberators, besides putting the latter in doubt as to the direction in which to continue their gallery.

After overcoming many difficulties the gallery was extended a yard or two further in, many of the workmen having to lie along the planks and lift out the stuff with their hands; but, owing to the lights and the number of men at work, the air soon became so vitiated that but little advance could be made. Ventilators were employed, but their co-location and use caused frequent stoppages, and delayed the work. There was no want of enthusiasm; but what could be done in a space of less than 400 cubic feet, 18 ft. by 5½ ft. by 3 ft., with only one outlet for the vitiated air. It was even proposed that they should recommence their gallery, widening it as they went in; but to this was replied that they hoped to liberate living comrades, not to extricate their corpses.

On reaching, in the night of the sixth day from the commencement of their working, the eighth yard of their gallery a small opening was effected; but no sooner was it made than it was closed again, owing to a premature attempt of one of the enclosed to thrust himself through. That brought down a quantity of loose earth, &c.; nevertheless advantage had been taken of the opportunity to pass in a bottle of milk. Shortly afterwards they came across a large rock buried in the debris that at first appeared to block up their gallery, and bid them despair; but which ultimately was a means of crowning with success their resolute and persevering endeavours.

In three days more all but one who had been killed on the first day, crushed by the first fall of the hill, were liberated from their perilous position. Four on the morning of the eighth day of their imprisonment by means of a passage excavated beneath the said rock, but which almost immediately closed in, and prevented the rest from following. Five more escaped on the evening of the same day through a passage cleared for them on the top of the rock, which also fell in, and stopped the egress of the remainder. But men who at the risk of their lives had thus far succeeded were not of the kind likely to allow their ardour to be damped by any repetition of untoward accidents or the completion of their heroic and self-imposed task. At last, on the morning of the ninth day, they were rewarded by the liberation of the five remaining prisoners, through a passage that with indomitable constancy they had during the previous night driven on one side of the aforesaid rock.

Previous to entering on some account of the dietetic treatment of the disinterred, it behoves us to elucidate the situation in which they so suddenly found themselves placed, their number, resources, &c. At 6 o'clock A.M., on Oct. 23, there entered the mine, as usual, the morning party, composed of 13 working miners, one carpenter, and their majordomo, or captain; eight men, of from 15 to 25 years of age, four of from 25 to 35 years, one of 49 years, and one of 65 years. The space in which they were collected may measure about 500 cubic yards. The food they introduced with them was their breakfast, consisting (each man) of one loaf of bread, 500 grammes weight, and 250 dried figs; they had water, but unwholesome, as on filtering through the hill it came in contact with copper and iron pyrites. The air in such a confined space would soon become impure, as it could only be renewed through cracks in the hill, or by filtration through the loose earth or dead stuffs. Afterwards, as above stated, owing to the agglomeration of lights and men employed in their delivery, the air of the whole or of the greater part of the mine was vitiated. In this state of uncommunication, without light, without a supply of food other than what the raw hide of their shoes and of the bags used for carrying ores might be said to furnish them, they remained 22½ hours—from 6 o'clock A.M. of Thursday, Oct. 23, till half-past 8 o'clock A.M. of Sunday, Nov. 9.

To each one immediately on his exit, but while still within the mine, was administered 30 grammes of wine of quinine; he was then blindfolded, and carried out into the sunlight. Not even those who were delivered first were able to walk. They were then distributed in two "ranchos" or huts that had been purposely prepared for them, and to each one was given 30 grammes of broth, mixed with 30 grammes of port wine. On their first exit their respiration was slow and difficult; pulse small and feeble, 56 to 60 per minute; temperature low, but circumstances impeded the latter from being noted thermometrically. After their first dose of food the sufferers recovered a little of their heat, their pulse became more frequent, and their voice more animated. Afterwards to each was administered half-hourly 60 grammes of rice-water, and at the end of two hours a second dose of broth with port wine, this time 60 grammes of each, and not until the afternoon of the morning of their delivery were they allowed other food than thin soup with sops of bread, under the inspection of two special officers, one in each hut. Owing to this strict regimen all the 15 (except the one fatal case above noted) were saved, and on Nov. 15 most of them returned to their work with their usual tranquillity. According to their own statement during the first three days they were, notwithstanding their hunger, able to work almost as usual. After this they felt, they say, a kind of languor and giddiness, but were still able to stand. During the last days this languor entirely overcame them. On the last day only the captain and another could stand upright; the remainder lay without motion, indeed to all appearance dead. Their captain was a man of energy, and much respected by them. Thanks to him, when the single bottle of milk was passed in it was duly portioned out among the whole of them.

By the Translators.—All honour to the captain who by conduct, courage, and firmness liberates or assists in liberating his crew, be it from a wooden or iron prison suddenly sent adrift on a storm-

given ocean, or from a darksome and equally fearful prison suddenly developed in a blast-riven mine. We regret that we are unable to consign to the columns of your widely circulated Journal the name of the mining captain disinterred at the Tortolas.

P.S.—It appears to us that in like cases one of the first, if not the first, thing to be done is to devise some means of passing food to the sufferers; this once effected many of the errors due to the inadequateness of workings commenced in haste might be avoided, as in the example before us of a gallery of only 5 ft. by 3½ ft. on the point of being abandoned as unfit for the purpose. Where a bottle of milk was passed a tube could have been introduced to facilitate a further supply of the same or of other liquid food. A stout iron tube corked at its inner end, and the cork covered by an iron capsule, might be driven by a sledge-hammer through several yards of dead stuffs, its outer end being in some way protected against the effects of the hammering.

Santiago de Chile, Dec. 17.

WM. A. WALKER.

AUSTRALIAN AND TASMANIAN TIN ORE.

Sir,—From a comparison of the Australian and Tasmanian tin ore and tin statistics for the years 1877 and 1878, which I have carefully compiled, it is evident the production in those quarters is on the decrease, as will be seen from the following figures:—

The total shipments of tin to England and America via London, in 1877, amounted to 9572 tons, of which Tasmania contributed 4500 tons, leaving 5072 as the yield of the Australian mines; while in the latter year the shipments were 9437 tons, including 5208 as Tasmanian supplies—thus showing that Australia afforded 843 tons less than in the previous 12 months; that is, 4229 tons in 1878, against 5072 in 1877. It will be at once apparent from the above that it was the excess of 708 tons in 1878 from Tasmania which enabled the two years' shipments to approximate so nearly; but that the supplies from that island also are decreasing there can be no reasonable doubt, as at the 5208 tons 3005 were exported for the half year down to the end of June last, leaving but 2203 for the following six months; and if the reports received from there by last mail be verified—That at the N.E. Coast Mines a very perceptible falling off in the yield is apparent, arising from the fact that the cream has been taken off the richest claims, and that some will not pay at the present price of tin, a much greater falling off may be looked for. The importance those N.E. Coast Mines have played will be understood when it is known that out of 7623 tons 1 cwt. of tin ores received at Launceston and Hobart Town for the 12 months ending Dec. 24 last those mines sent 4249 tons 11 cwt.

Some five or six months since very glowing accounts were in circulation as to the richness in tin of certain districts on the West Coast, and great hopes were built up in consequence; but those expectations have received a severe shock, as but a few tons of ore have been sent into the market from that source, and some of the explorers have returned to Launceston greatly disgusted with the whole affair, and denouncing it as a swindle.

From the foregoing I think it may be safely inferred that unless some further new and important discoveries are made the shipments from those colonies for the current year will fall fully 2000 tons under those of the last, and should this estimate prove correct it can have but a beneficial influence on the future market price of the article.—*Gracechurch Buildings, Feb. 18.*

D. STEVENS.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

Sir,—I read in last week's Journal a paragraph evidently emanating from Mr. Pearson. It would appear that he wishes the shareholders to look upon him as their friend, and the one to whom they must look for a means of escape from their present troubles. After stating that he is authorised by the sole owners recognised by the American law to treat with the share and debenture holders, he says he "obtained the consent of the petitioners for liquidation to allow the petitions to stand over for a few months to permit the necessary arrangements to be made." The shareholders will be able to estimate the disinterested conduct of Mr. Pearson at its proper value when they know the fact that one of the petitions, the only one which has given serious trouble to deal with, is one presented by a friend for 400 guineas, the balance of the 500 guineas Mr. Pearson claims for his time in visiting Utah, exclusive of 2500, paid him for expenses, and which claim was transferred to the petitioner the day before the petition was presented. Who the "sole owner" referred to is I know not; and how anyone, pending the litigation now going on, can be in a position to deal with the property I am at a loss to understand. The time has not arrived for reconstruction. It is useless to attempt anything of the kind until the questions affecting the company's title are disposed of.

London, Feb. 20.

A. KERLY,
Solicitor to the company.

RICHMOND MINING COMPANY.

Sir,—Your correspondent, "Prudence," may be nearly right in estimating the Richmond reserve of ore now in view as equal to 2½ per share, but he can hardly be otherwise than wrong in taking this 2½ as the entire value of a share. In the grounds belonging to the company, if there are no more "Pott's chambers," may there not still be ore pockets of a smaller size? and it is surely only fair and natural to suppose that where so much ore has been already found there may still be some remaining. These chances must be worth something, and after deducting the risks of the impending lawsuit the remainder may possibly not be very far short of 8½ per share. The present price of 10½ per share may, therefore, be reckoned as made up of—

Reserves of ore in sight.....	£ 2
Chances of future discoveries, less the lawsuit risks ...	8
Total	£10

One thing, however, to be feared in connection with Richmond is that that the shareholders do not participate immediately and fully in the information sent from the mine. Thus the report of the committee's engineer has been kept back, or when alluded to has been pooh-poohed, though why this report should be known to the directors and remain an unknown quantity to the shareholders it is hard to say. Supposing shareholders in connection with this had been puzzling themselves and examined the register of transfers in the office of the company, they could only have come to one conclusion on finding that, meanwhile, reputed friends of some of the directors had been selling their shares by hundreds. The reflection also might arise that in the event of anything of a dangerously serious character happening to the undertaking, that also might possibly be kept from the shareholders. It is, therefore, tolerably obvious that the security of the shareholders requires that all information from or respecting the mine of such a character as might affect the value of the shares should be published immediately when received, and that directors, directors' friends, and shareholders should all sail in the same boat.

London, Feb. 19.

ONE INTERESTED.

RICHMOND MINING COMPANY.

Sir,—The criticisms which have been made through the medium of your Journal on my recent letters having been entirely of a personal nature, it is scarcely necessary that I should take notice of them. I would ask those correspondents, however, if it is not the fact, as stated by me, that the expenses of the mine, as shown by the last accounts, amounted to 9½, 5s. per ton of ore smelted, while the real value of the ore now being used (£50 to £55) is not more than from 8½ to 8½, 15s. per ton? The wonderful statements which have been recently made, in obscure journals and stockbrokers' circulars gratuitously circulated among the shareholders, to the effect that 10,000,000 per month profits are being realised from £50 ore, and other fabulous assertions, which no attempt is made to prove, are certainly very amusing; and in the case of one journal (the Hornet), where a full page of paragraphs is devoted to the subject, it is not quite clear whether the article was written for the amusement or instruction of its readers. Judging from the statements made, and the nature of the other articles it contains, I would charitably suppose that it was written with the former intention; but if seriously

meant for instruction it is a pity the writer did not explain how it is that the profits of the mine should now be greater (10,000,000 per month) with £50 to £55 ore than they were a year ago, when the value of the ore was 50 per cent. greater; and where the implied saving of 60 per cent. in working expenses has been or could possibly be effected.

If the mine was really such an Eldorado as the public are asked to believe, it appears rather strange that so much trouble, not to speak of the expense, should be taken to keep us advised of the fact, and that there should be so many ready sellers of the stock still in the market. Certain insinuations have been made regarding my object in calling attention to the present unsatisfactory state of the accounts of the company, which I am glad to say are very far from the mark; but I think the object to which the literary efforts referred is much more apparent—to get the general public in as buyers at present prices, in order to relieve some large purchasers who are beginning to find they have made a bad bargain.

Feb. 19

INVESTOR.

COLORADO UNITED MINING COMPANY.

Sir,—You were kind enough to insert some remarks of mine on these mines on Feb. 1, and I note that Mr. Cazin, of New Mexico, has a letter in the Supplement to last week's Journal on the same subject. He bases his remarks as I did, on the article which appeared in the New York Journal of Dec. 23, and they are interesting to the shareholders of this property, representing as they do the opinions of those on the other side of the Atlantic. I think he is in error as to unloading the stock by two gentlemen. I believe there was only one gentleman over on this side on the matter, and the gentleman who got the largest number of shares from the amalgamation did not part with a single one, but has since purchased 4000 more from another of the vendors, showing his confidence in the mine, and there is no one more capable of judging of its merits. Mr. Cazin confirms my opinion of the intrinsic value of the mine—"I know the property; it is one of the best on this continent, deserving a most energetic development, and able to sustain such development simultaneously with dividends." These are his words, and they should be reassuring to the shareholders; but Mr. Cazin says to do this the "Augean stable at home must be thoroughly cleaned." I do not suppose that he means the directors; they have the reputation of being respectable, and are not suspected of tampering with the stock, but what he says is echoed from all corners of this city, and it is high time the directors looked to this. They are responsible to the shareholders, and it is owing to their feeble and inert management that the shares of this splendid property are selling at one-fourth of their value; and if they are worthy of their position they must put this right, or they should give place to better men. Why do they keep back all information as to the whole state of affairs—no letters, no telegrams. We were told six months ago that one of them was on his way to the mine. Has he returned, or is he there still? Has he brought or sent no tidings whatever? The secretary sailed on Jan. 9 for the mine. What has he done? Is there no intelligence from him? No letter or telegram? Is he acting for the company? There has been plenty of time to have heard from him, and the information should be given to the shareholders. Information comes to other persons in London from the mines. Why not to us? I hope the directors will do their duty, make an authoritative statement of affairs to the shareholders, which they should supplement weekly if necessary, make a rigid enquiry into the charges made against their officials, whom they should discharge if proved against them, and by efficient and honest management dispel the clouds hanging over and blighting this splendid property.

London, Feb. 19.

A CANNY SCOT.

THE THARSIS SULPHUR AND COPPER COMPANY.

Sir,—Last year you inserted a letter from me bearing upon the figures of the Tharsis report for the year 1877; and as the time is now rapidly approaching when they will be closing their accounts, I think it is desirable to refer to some portions of my previous remarks. The chief points to which I referred were:—

- 1.—The fact of the company publishing no profit and loss accounts.
- 2.—The great increase in the company's debts which had taken place.
- 3.—The apparent recklessness of dividing all the profits shown in the accounts, especially in view of the very unpromising condition of the copper market then ruling.

Events that have since occurred, especially in Glasgow, make it more than ever imperative that companies should fulfil the spirit of the law, which provides that they shall publish accounts showing their revenue and expenditure under their proper heads. I do not wish to insinuate for one moment that the absence of such a proper account on the part of the Tharsis Company indicates anything wrong in their case; but what I do maintain is that in the public interests, if the shareholders neglect their obvious duty, companies of such magnitude as the Tharsis should be compelled to publish such a statement, because, as the failure of the City of Glasgow Bank shows, wrong doing if it exists does not merely affect the company which commits that wrong, but also the safety and existence of others. No proof of the respectability of the directors of a company (and in the Tharsis Company no doubt such is the case) is sufficient reason for neglecting the protection to the public which the law seeks to secure by the publication of full and accurate accounts.

In the balance-sheet of the Tharsis Company I consider that the two items of increased debtors and increased creditors need much more explanation than is given; for if, as I understand, the increase in the debtors was caused by sales made towards the end of the year, it is evident that, including the stock which should have been in existence to provide those sales, the total stocks in trade were at that date valued at some 130,000, more than in the previous year, and this in the face of the fact that in the commodities thus valued a fall in the price of over 10 per cent. had occurred. To permit of such a greatly increased valuation, therefore, the stocks would appear to have increased in quantity during the year by about 33 per cent. The further fall in the copper market of about 10½ per ton since this time last year must presumably have made such a serious diminution in the profits of the company as to have again seriously increased its debts, because the payment of the large dividends during the past year could not, it would appear, during that period have been met by corresponding profits in that time.

If in these remarks I have fallen into error the company and not I must be blamed, as full and proper accounts would avoid the possibility of errors and misconceptions.

Feb. 20.

ACCOUNTANT.

SOURCES OF POWER.

Sir,—The electro-magnet engine is one from which great expectations have been put forward, and its application to various uses has been suggested, such as driving coal-cutters in mines. An experiment of this kind was lately tried in a Lancashire mine. It may be supposed the result would be found to be too costly in practice. The following gives the relative cost of fuel used for various engines, the cost of the steam engine fuel being 1; Ericsson's air engine, 0.84; gas engine, 6; electric engine, 55.

The electric engine and the gas engine are convenient as sources of power. They can be set in motion without delay, and no expense is incurred when they are off work, and they can advantageously be used where a small power is required at intervals of time, but they are expensive (the electric engine more particularly) on a large scale. In the steam engine, the air engine, and the gas engine the heat and motive power are derived from coal; in the electric engine the motive power is derived from the zinc used in the galvanic cells.

A common form of electric motor is founded on the fact that if an electric current passes through a wire which is wound around a bar of soft iron the iron is converted into a magnet, and will continue so as long as the current flows; as soon as the current ceases the iron as quickly loses its magnetic property. Such a bar of iron, rapidly magnetised and demagnetised, is used to impart motion to other pieces of iron.

A common electric engine is formed by a wheel and eight bars of soft iron attached to its circumference at equal distances. Four electro-magnets are placed close to the wheel, and are so arranged

that the current circulates in the wire wrapped round each only when one of the bars of iron on the circumference is approaching to it, and the current is interrupted as soon as the iron passes. The bars of iron are thus pulled by the magnets in the direction in which the wheel is revolving, and a continuous and rapid motion can thus be maintained. The action of the electric current is regulated by a cog-wheel, fixed on the axis of the machine. The electric magnets are thus made to be alternately active or inactive at the proper time.

The work done by an electric engine is at the expense of heat, produced by a solution of zinc. The great drawback to this engine is the cost of the substances used to produce the current. The price of zinc is 30 times greater than coal, and unless some cheaper mode of generating electricity is discovered this engine cannot come into use in cases where a steam-engine is available. M. E.

SURFACE CONDENSERS.

SIR,—I read with much interest Mr. Schonheyder's valuable paper on this subject in last week's Journal, which was read by Dr. Le Neve Foster at the Cornwall Mining Institute, Camborne, and am greatly surprised at the objection raised against its adoption in Cornish mines. The economical merits of this apparatus have been abundantly proved, and only too feebly set forth in the said paper, to which might be reasonably added an economy of 10 per cent. of fuel, especially where there is any tendency to incrustation.

In an enquiry upon the incrustation of boilers of steamers by M. Couste it is stated that 8 or 10 per cent. of the heat of the fuel is lost after the first few days' work—at Bordeaux 15 per cent., and at Havre, after some days of constant work and observations, 40 per cent. In general practice it has been estimated that 40 per cent. of the heat of the fuel has been lost by incrustations and deposits in boilers of steam vessels. From this and my own experience I should naturally infer that prevention of incrustation is a positive economy of fuel in the first place, in addition to the other eight advantages summarised in Mr. Schonheyder's paper. This puzzling question, then, which has so long foiled all the most eminent chemists and engineers of the world, is now solved like most all other great puzzles of the kind in a very simple and unexpected manner, without the aid of the chemical, and bringing with it numerous advantages which will undoubtedly give new life to the deep Cornish mines.

From the discussion which followed the reading of this paper suggestions were made for securing rain water for the boilers. Now, in feeding a boiler which takes its feed from a surface condenser it could in the first place be filled with water, totally deprived of all corrosive ingredients, and this water would, as a rule, after having passed through the engine in the form of steam, be returned to the boiler again by the feed pump, and all the pure water which it would be necessary to add to it for maintaining sufficient feed in the boiler would be simply the quantity escaping as waste steam through the safety valves, stuffing boxes, &c., a quantity so small that it could be obtained from very bad water for a mere trifle. With such an arrangement it is evident that only pure water deprived of all corrosive elements would enter the boiler. Whilst considering the use of rain water for this purpose it may, perhaps, be interesting to some to hear the opinion of others on the subject.

In the Engineering of Jan. 24 the leading article is headed "Feed Water for Land Boilers," and passing over the introduction it goes on to say:—"It will be readily understood that if a boiler has to be worked with a surface condenser, or fed with rain water on land, the conditions are practically identical with those obtained at sea. This being the case, it seems likely at first sight that if pure or distilled water is injurious to marine boilers, we ought to find land boilers fed with similar water liable in like manner to speedy decay. The conditions are, however, not quite the same, but there is reason to think that land boilers worked with very pure soft water, or with that supplied from surface condensers, are liable to rapid destruction from corrosion. In spite of all that has been done to clear up the mysteries of corrosion, it is certain that much remains to be learned. So impossible is it to overlook this fact that a very important series of experiments are now being carried out under the supervision of Mr. Parker, chief engineer surveyor to Lloyd's, which will, we have reason to think, teach much that the world wants to know. To those of our readers who may from ignorance of the subject fancy that the mystery of the question involved has been over-rated, we may point out that while one set of marine boilers will last for as much as five years with unimportant repairs, the destruction of another set, worked apparently under similar conditions, may proceed with appalling rapidity. A few days since we examined a portion of a new 3 in. boiler tube, apparently of excellent material, which was eaten through in a dozen places, the whole mischief being accomplished in only 20 days' continuous steaming. All the tubes were more or less attacked. Mysterious as the corrosion of boilers may be in many respects, enough fortunately is known to enable steam users, whether on land or sea, to adopt certain precautions which will do much to neutralise the bad effects of special feed waters. We shall not attempt to explain here why rain water should corrode boilers; there can be no doubt that in a sense it does, and for our present purpose it will suffice to take the fact for granted, and try to suggest a means of avoiding the evil results which its use may bring about. The surest way to avoid risk is not to use rain water except occasionally, and for the specific purpose of cleaning out the boiler. In most cases it will be found that rain water has a powerful solvent action on deposit. If a dirty boiler be blown out, filled up fresh with rain water, and fed with nothing but rain water for a couple of days, a very large quantity of deposit will usually come away when the boiler is next blown out, and surfaces which would otherwise have required the hammer and chisel to free them from incrustation will be found almost quite clean; this result does not invariably ensue on the use of rain water, but the exception only from the rule. Rain water is irregularly used so far as our experience goes only when land water is very hard; but in all such cases it would be much wiser to soften the land water than to use rain water. The softening may be effected either by Clark's process, which consists in adding more lime to the water, allowing it to settle, and drawing off the clear water, or which is much better by heating the feed water before it is pumped into the boiler in the following way," &c.

The advantage of heating being derived from the fact that salts of lime and magnesia are more soluble in cold than in hot water, this duration of a boiler of 5 years versus 20 days under similar conditions is undoubtedly as mysterious as the wondrous qualities of rain water, which in the one case is so strongly condemned for its corrosive qualities, and in the other so highly recommended as a preventive of incrustation. Both boilers were fed from a surface condenser, and the waste water to make up the deficit, occasioned by waste of steam through safety valves, &c., was taken from the sea. How, then, can the enormous difference be accounted for? We must assume that one boiler evaporated as much water in 20 days as the other did in 5 years, or there must have been a difference in the quality of the metal, because they were both acted on by the same solvent. The latter, I should suppose, the most probable cause of the mischief, although it is probable the former did its share thereof. Evidently if one engine was doing good duty, and the other had with great waste at the safety valve, &c., and the same amount of work done by both engines, it would naturally require a greater evaporation in one boiler than the other, and consequently necessitate a greater quantity of salt water being passed into it, which might partly account for the rapid destruction. The rest must be attributed to the quality of the metal, which from the fact of its being full of holes clearly shows that it was not uniform in structure, the whole surface having been exposed to a uniform solvent.

As regards the corrosive qualities of rain and distilled water, I have no doubt that all users of steam in mining districts hold quite an opposite opinion, and would prefer it almost to any mine water; and as to its qualities of preventing incrustation, I think it rather strange that so many scientific men should have failed in preventing it through many years of study and experiment, whilst in Cornwall especially they have had the means of doing it pouring down on their heads so profusely. I do not ascribe to it either of these qualities, but believe for feed water there is none better, and that in connection with the surface condenser and other numerous improvements, if promptly applied, will restore to Cornwall the reputation which seems to be fast passing from her, and bring the mines again

into a prosperous state, which is the only excuse I have for intruding on your valuable space.

Stanley-street West, North Shields.

WM. NANCE.

BRITISH MINES—INTERESTING NOTES.

SIR,—The following is extracted from Hone's Table Book, 1827:—"Mines of gold and silver sufficient to reward the conqueror were found in Mexico and Peru, but the island of Britain never produced enough of the precious metals to compensate the invader for the trouble of slaughtering our ancestors. Camden mentions gold and silver mines in Cumberland, a mine of silver in Flintshire, and of gold in Scotland. Speaking of the copper mines of Cumberland, he says that 'veins of gold and silver were found intermixed with the common ore, and in the reign of Elizabeth gave birth to a suit at law between the Earl of Northumberland and another claimant.' Borlase, in his History of Cornwall, relates that 'so late as the year 1753 several pieces of gold were found in what the miners call stream tin; and silver is now got in considerable quantity from several of our lead mines.' A curious paper concerning the gold mines of Scotland is given by Mr. Pennant in the Appendix, No. 10, to his second part of a Tour in Scotland, in 1772; but still there never was sufficient gold and silver enough to constitute the price of victory. The other metals, such as tin, copper, iron, and lead, are found in abundance at this day; antimony and manganese in small quantities. Of the copper mines now working in Cornwall, 'Dolcoath,' situated near Camborne, is the deepest, having a 220 fm. level under the adit, which is 40 fms. from the surface, so that the total depth is 260 fms., or 1560 ft.; it employs upwards of 1000 people. The Consolidated Mines, in Gwennap, are the most productive, perhaps, in the world, yielding from 10,000 to 12,000 lb. a month of copper ore, with a handsome profit to the shareholders. Great St. George is the only productive mine near St. Agnes, and the only one producing metal to the English Mining Association.

"Of the tin mines, 'Wheal Nor,' in Breague, is an immense concern, producing an amazing quantity, and a large profit to the company. Carnon Stream, near Perran, is now yielding a good profit on its capital. It has a shaft sunk in the middle of the stream. The washings down from so many mines, the adits of which run in this stream, bring many sorts of metal, with some curious bits of gold. Of late years the mine called Wheal Rose, and some others belonging to Sir Christopher Hawkins, have been the most prolific of lead, mixed with a fair proportion of silver. Wheal Penhale, Wheal Hope, and others promise favourably. As yet Wheal Sparrow has not done much in cobalt; the quality found in that mine is very excellent, but quantity is the 'one thing needful.' The immense quantity of coals consumed in the numerous fire-engines come from Wales; the vessels convey the copper ore as it is brought by the copper companies to their smelting works; it is a back freight for the shipping. Altogether the number of individuals who derive their living by means of the mineral district of Cornwall must be incalculable, and it is a great satisfaction to know that this county suffered less during the recent bad times than perhaps any other county."—Feb. 18.

H. C. S.

IS IT RIGHT TO PAY ANY PURCHASE-MONEY FOR MINES?

SIR,—Your correspondent, Mr. William Salmon, in discussing this question in last week's Journal leads his readers on the wrong track by assuming that those who do not entertain the same views as himself entertain views which they would be the last to support. In connection with this question Mr. Salmon maintains the affirmative. I maintain the negative; and yet to a very great extent I and Mr. Salmon agree with each other. As it is always better to take a case than to argue upon purely hypothetical grounds we will choose that mentioned in the City Article of the same Journal in which Mr. Salmon's letter appears, and which was more fully referred to in the City Article of the previous week; but it must be understood that I only take this for the convenience of reference—so that no observation I may make upon the principle, as applied in this particular case, must be regarded as applying to this mine alone. Mr. Salmon states that he cannot see what reasonable objection there can be to the payment of a purchase-money for a mine as for anything else. No more can I. But I contend that the capitalist paying for the mine in the royalty which he undertakes to pay to the mine lord; in fact, that the royalty paid to the lord is as much a rental as the rent of a house, and that, therefore, there is no reason for the purchaser of a mine any more than for the incoming tenant of a house to pay money for the right to occupy. Taking the amount paid as royalty Mr. Salmon must admit that it is equivalent to the tenant's rental, and not at all like the leaseholder's ground rent.

The miner, as related to the mine lord, never acquires any benefit from improvement of the property like the ordinary leaseholder does. If I obtain the lease of an estate of one acre for 99 years at 20 per year ground rent, the value of the property thereon at the time being 100 per annum, I purchase on the assumption of 80 (minus the cost of repairs and value of risk undertaken) per annum. If I improve the property so that I can obtain 1000 per annum instead of 100, I still pay the landowner 20 per annum, and no more. Not so in the case of a mine lease, which without any exception saddles me with a dead rent or its equivalent equal to the full value of the land, and, in addition, inflicts a heavy fine upon me for making improvements by charging me for even the necessary surface damage, and making me pay a higher rental the more efficiently I work the property. Assuming the royalty to be one-twentieth I pay a rental (royalty) of 5 per annum if I raise 1000 lb. worth of ore, and 5000 lb. per annum if by my greater expenditure and energy I raise 10,000 lb. worth of ore. I should be inclined to admit that I ought to pay a portion of this 4500 lb. fine because I take away a certain portion of the corpus of the estate; but to be able to argue with Mr. Salmon I must come, although I do not admit, that in "a well-developed mine in which several thousand pounds have been expended the purchaser has the full benefit of that expenditure," whence it follows that the exhaustion of the corpus does not lessen the value, and, therefore, need not be considered.

Accepting Mr. Salmon's view that exhaustion of the corpus never, at all even, lessens the value of the mine lord's property we may leave all consideration of the matter as between adventurer and mine lord out of the question. The adventurer, accepting Mr. Salmon's view, holds a mine in the same way as a trade-man—a grocer if you will—holds a shop; he is entitled to purchase as much produce as he likes at a price which is represented by the cost of raising (including all charges, directors' fees and contingencies of every kind) plus the royalty, and to sell such produce in the best market. The different will represent his profit. Now, if the grocer wants to sell his business the purchaser will only be required to pay the value of the business as it stands and upon the estimate of the profits actually realised; he certainly will not be expected to pay upon the estimate of what the business may be hoped to yield with increased energy and greater judgment. The purchaser will not be asked to reimburse the seller for horses that have died, carts that have been worn out, or servants' and assistants' wages that have been paid since the seller commenced business. But when a mine is sold he is asked for all this; and not only so but to saddle himself with interest in perpetuity upon the capital thus fruitlessly, if not recklessly, expended. This is the reason all mines do not yield profits to an extent fully to satisfy shareholders.

In the mine in question much capital has been expended, both under the management of Messrs. John Taylor and Sons, and under the present management—the former managers abandoned it as unlikely to repay further outlay; the present managers have expended 16,923 × 30 = 507,690, without realising a penny of profit. The market value when the sale to a new concern was decided upon was 16,923 × 50, or, in round numbers, 846,150. The purchaser is required to take over the liability to pay rental and royalty, and it may be assumed, for the sake of having a figure, that the valued inventory of the plant would be 20000 (if it be worth more than that the figures must be altered to the extent of the difference; I should think, however, it would be lower rather than higher). This gives 60000 as the present real value, yet the new company are asked to purchase at the price of 30,000, and, consequently, the

20,000, which is fixed as the requisite amount of working capital has to earn dividends on 50,000, instead of 26,000, so that disappointment is as inevitable as if a tradesman paid 50,000 for a business worth at the time of purchase 26,000 only. Perhaps Mr. Salmon will state how he would calculate the premium to be paid by the purchaser in such a case as that I have pointed out.

Feb. 18.

ACTUARY.

PROMISING ENTERPRISE—COPPER IN SANDSTONE.

SIR,—In reading last week's Journal one cannot help being struck with the controversies which have been going on respecting the relative value of mining properties abroad, and it has occurred to me that whilst seeking foreign fields for a profitable investment we are neglecting to look at home for the same. This I think must be the case when I see that such a valuable property as the Alderley Edge Mines, Cheshire, is now lying idle, and where such extraordinary results accrued from the working of that sett for a term of 21 years, during which time splendid dividends were paid, and large sums of money expended in experiments, which all came out of the profits of the undertaking, the original capital to my knowledge being practically nominal. This mine is situated at the north-east of the county of Cheshire, about one mile from the village of Chorley, on the London and North-Western Railway.

The formation is Keuper sandstone and conglomerate, and, as its name indicates, contains copper, and in the form of carbonates, and which the late company extensively worked by the wet or hydrochloric process, the *modus operandi* of which was fully explained by Mr. W. Henderson in your Journal during the year 1860. Not only is cupreous sandstone known to exist over a large area in this neighbourhood, but it has been found at the Peckforton Hills and other localities in Cheshire.

The Alderley Edge Mining Company during the holding of their lease worked over several hundred thousand tons of this cupreous sandstone, and which was got out principally by quarrying, consequently this mine has never been developed to any depth. I remember the late Mr. James Michell, the originator of these works, expressing an opinion that a shaft should be sunk for the purpose of proving the mine in depth, but owing to his death this was never carried out, and therefore nothing is known to a certainty of the nature of the ground below the workings prosecuted by the late company.

I notice that in the year 1864 this company worked over 14,696 tons of sandstone, producing 203 tons of fine copper, thus giving an average of 1.4 per cent. per ton of ore, and I see no reason to doubt but that equally favourable results would accrue if the property was taken up by a spirited company, for there is not the least doubt but that there exist large deposits of cupreous sandstone, to say nothing of what might be discovered in depth. I am quite of opinion that even at the present low price of copper this property might be made a good paying concern, more especially as the precipitate—which contains a certain amount of silver and cobalt—sells readily to chemical manufacturers, the late company having had for several years a contract with Messrs. Bouck and Co., Manchester, for the whole of their production.

In conclusion, I may say that it will afford me great pleasure to supply any information respecting the locality, &c., that lies in my power, as I am confident that capital invested in this undertaking would realise a very handsome return.

J. F. MICHELL.

London, Feb. 20.

DEVON GREAT CONSOLS MINE—WAGES QUESTION.

SIR,—I observe some remarks as to a reduction of wages having been ordered of 10 per cent. My idea is that it ought to have been at least 20 to 25 per cent., which would only then be equal to the reduction in the price of food and clothing, &c., made during the last seven months, so that 13s. a week wages now will buy as much or more as 16s. 6d. did some seven or eight months ago. Bread, for instance, instead of being at 8d. to 8½d. is now at 5d. to 5½d. the loaf. Indeed, as was stated only a few days ago by one of Her Majesty's Cabinet Ministers, the cost of living is now cheaper than it has ever been for the last 25 years. If this country is to compete with foreigners either in produce or manufactured goods the rate of wages will yet have to be considerably reduced, and at the same time we may also anticipate much lower prices for articles of consumption, looking at the enormous import trade going on and daily increasing. This is not a matter as affecting only the above company, but a question for the serious consideration of managers of all metallic mines, and those employed by them, in order to keep the various undertakings on their legs, and so compete with foreign competition and importation. Unless this is done most of our mines now struggling on for an existence must shut up.

Deaconport, Feb. 18.

FINANCE.

DEVON GREAT CONSOLS.

SIR,—Your correspondent, in last week's Journal, should at least have confined himself to the truth, for I find on enquiry that the statements he has made are not quite as he would desire your readers to believe. If "Live and Let Live" is in the employ of the company, and he can find higher pay, I dare say his services could be easily dispensed with, and possibly equally as good a substitute found at a lower rate of wage. The arsenic, I find, which has been sold has gone towards paying off the loans, labour pay, merchants' bills, heavy dues, land damages, and so forth; and, from all I can learn, the board of directors are to be highly commended for what they have done and are doing to keep these mines from even suspending operations. I do not believe but what the miners and others employed clearly comprehend the present depressed state of affairs. A further fall in about nine months of some 12½ per ton in copper—perhaps lower than for the last half-century—is a fact which cannot be denied, and speaks for itself. As for the rate of wages in Devon, I have made it my business to enquire into this, and I am informed that this company pay much higher to those they employ than most mines in Cornwall or Devonshire. It is estimated that there are now about 1,250,000 hands out of employ in this country, and half of this number working only about half-time. Does "Live and Let Live" desire to see those for whom he professes to write—without their knowledge or consent—added to this number? The day may not be, perhaps, far distant when this may come to pass (with many other concerns) unless there is a mutual feeling between employer and employed, the want of which has been the means of bringing round the greatest depression and ruin this country has ever experienced.—Tavistock, Feb. 20.

AN OBSERVER.

HINGSTON DOWN CONSOLS.

SIR,—One of the unfortunate results of the long continued universal depression is a contemplated modification of the operations connected with this valuable property. That the workings of such an extensive and productive tract of mineral ground should be even temporarily suspended is a great misfortune to the whole neighbourhood. It is one of the largest mineral grants in the Duchy of Cornwall, and is intersected by a great number of lodes; only one, however, has been tried to any extent, from which hundreds of thousands of pounds worth of copper ores has been raised, and this lode still continues productive down to the deepest point reached, and at various other points of operation the mine is well supplied with steam-pumping, hauling, and crushing machinery. The dues are merely nominal, and a very moderate capital only would be required to make this a great property. A junction of granite and killas takes place within the limits of the sett, and all the characteristics of the great tin-bearing mines in the West are remarkably prominent, leading to the natural conclusion that, like Dolcoath and other similar successful enterprises, great deposits of tin will be found underneath the copper as the workings deepen.

There is a very fine lode only about 30 fms. south, which could easily be reached by cross-cutting from any part of the present workings, and the whole of the Gunnislake (Clitters) lodes pass to the north of the lodes now worked upon, which could also be intersected in the same manner, and in which direction there can be no reasonable doubt important discoveries will some day be made. An adit level has been driven a considerable distance south from the

northern portion of the reef for the intersection of the untried lodes, and is fast approaching some of them, as is strongly indicated by rich branches of ore met with as the driving progresses. It has been thought by many whose opinions are entitled to respect that home mining cannot cope with foreign competition; it is now, however, becoming apparent that with prices for mineral sufficiently good to prove remunerative to foreign mines there need be no great doubt as to the success of mining at home. HOPEFUL.

Feb. 19.

CORNISH MINING, AND ITS PROSPECTS.

The principal cause of mining capital being withdrawn from the county does not arise from any failure in the production of mines, but chiefly owing to the low price of metals, the general depression in the commercial world, and consequent apathy of the public. The four mines of Dolcoath, Cook's Kitchen, Tincroft, and Carn Brea, in extent two miles east and west, comprise a mineral property apparently inexhaustible, recent official reports demonstrating that increased depth yields increased wealth. These four mines have sold mineral from 1804 to 1874 amounting to 7,594,843. sterling. So recently as November, 1877, the same four mines sold at an aggregate market value of 337,000*l.* while the present market value on increased returns is only about 160,000*l.*, thus convincing the most sceptical that a turn in the tide of the metal market means increased wealth to the shareholders, and prosperity to "One and All." I can name four other good paying mines that have yielded to the pressure of circumstances to a greater extent than those with even better prospects, requiring the same cause to produce a corresponding effect. It is, therefore, no wonder that there just now seems a desire for enquiry into the real state of mines as regards their present productiveness and probabilities of a continued yield, with a view to the investment of capital. Another class of mines which I have long advocated is the opening out of new or unwrought ground, a discovery in some of which would lead to results such as the Great Consols, Treavean, United Mines, and Wheal Buller in Gwennap, which sold mineral amounting in the aggregate to 8,284,000*l.* The original capital called up from the shareholders to produce this result did not exceed 40,000*l.*, and judging from analogy there remains ground unexplored on the same veins, requiring only a small paid-up capital to open mines equally remunerative. It is, therefore, experience that emboldens me to assert that there is not one-half the mystery or speculation connected with the enterprise of mining as would appear to deter capitalists from its study. CHARLES BAWDEN.

St. Day, Scourier, Cornwall, Feb. 18.

OUR HOME INDUSTRIES.

Allow me to draw the attention of your readers to one of the greatest and most important points of the day in connection with the mining interests of Great Britain. The long-depressed state of trade brought on by the low prices of our manufactured or raw produce has brought about bad results. But, strange to say, proprietors, shareholders, directors, managers, captains, and the men under them still persistently stick to the old-fangled notions of working that existed with our forefathers. I allude to lead mining in particular when I say it is painfully true that although some few mining companies have availed themselves of special mining appliances for the cheaper production of their ores, yet the majority of the companies have not yet done so, while the reports from the mining companies that are using machinery speak loudly in favour of its use. I am sure the saving gained by the use of such machinery, combined with the reduction of freeholders' dues now being agitated for, will enable our various mines to compete better with foreign products, and while paying a fair dividend to shareholders and a fair wage to their men, would obviate the numerous calls upon the former and strikes of the latter, in which case we should hear of fewer disastrous mining failures. Science should step in, and put a stop to all this misery and uncertainty of action, for it is only by science, good judgment, and common sense that we can keep pace with the times and ahead of other nations. Look, for instance, at our American cousins, among whom every production of science is readily adopted, and genius is encouraged and rewarded. This brings me to another point—the want of encouragement to enterprising scientific men in Great Britain, the result of which is that in many instances those with the best talents have become disgusted with the indifference of those whose duty it should have been to give such encouragement, and have gone to other countries, where they have found some reward for their efforts. In conclusion, I strongly advise the mining interests of Great Britain to follow the example of most of our great industries in the economy of labour by the substitution of machinery for it. This will result in a common benefit to all concerned. A WELL-WISHER.

Moorgate-street, Feb. 20.

WHEAL BASSET.

SIR,—This old and formerly productive mine is abandoned at last. It has been trembling, so to speak, between life and death for a year or two; and I think that the shareholders have done wisely in giving over abortive attempts to make it pay its way. Their patience was most exemplary, but having received so large a sum as 300,000*l.* in profits, they entertained hopes that by an advance in the price of metals they might hold on their way in hopes that dividends would be resumed some day. I am sure that the lord of the land has no reason to blame the mine for the step they have taken, especially as they are about to remove some of the machinery to North Basset, part of the sett, which was added to Wheal Basset under the last lease. It is not for me to say whether the resolution to re-work North Basset is a wise one or not; there may be doubts on that point, and various opinions. The advocates for this proceeding will argue—firstly, that North Basset was, under Lyle and Co., a very productive mine, and yielded a large amount in dividends, and that at deeper levels a large deposit of copper ore and of tin ore will probably be found; that Grace's shaft, which is 140 fms. under adit, will intersect the "great flat lode" (known in South Carn Brea), by a deepening of that shaft which is on North Basset lode, and that at the junction of those two lodes a great mass of metallic minerals will be found, as is commonly the case under such circumstances; and, secondly, that having machinery of every description within the sett, the only expense to be incurred will be the removal and erection of the same on North Basset, and that 6000*l.* will be sufficient to cover all such expense, and the expense of pumping the water out of that mine.

On the other side of the question there are such arguments as the following—1. It is a very rare circumstance for any abandoned mine, which has been worked by experienced managers, to pay for a second trial when the mine is so deep as 140 fms. under adit, but such a circumstance may happen. When Messrs. Taylor reopened the Consols, Gwennap, the mine, I think, was only 60 fms. under adit; that turned out to be a prize of greater value than any other mine in Cornwall.—2. Who can tell whether the "flat lode" can be found within 50 or more fathoms of the present bottom, and if found who knows whether it will be of any value or not? There may be more known about it than I can tell as to its underlie, but of its yield of copper all must be equally ignorant. Notwithstanding the speculative character of the undertaking, if I were an adventurer in Wheal Basset, and partook of that mine's liberal yield, I would not hesitate to recoup some of my receipts in further developing North Basset part of the sett; but those who enter into the speculation should not think that 6000*l.* will go much further than the drainage cost.

The subsequent operations in sinking Grace's shaft to the junction of the flat lode, the driving of levels, &c., will amount probably to 20,000*l.* more, to be called up in portions, quarterly or otherwise, as the works progress. It is my earnest wish that this bold step on the part of the company will be followed with that success which they deserve and deserve, for their undertaking and previous praiseworthy perseverance in Wheal Basset.

The winding up of so many mines in Cornwall has brought upon the mining and mercantile community incalculable distress, such as I have not known for half a century. It is reported that all the works and merchandise at Perran Wharf, Tresillian, Gweek, and

Portreath are to be abandoned, but I cannot vouch for the truth of the report. I give it as a "hearsay." If it be true the mines have done it.—*Truro, Feb. 13.*

R. SYMONS.

"VIRGIN GROUND."

SIR,—Although nearly all the mines in Gwennap have been abandoned, many miners are of opinion that the parish is far from being exhausted of its mineral deposits. If the abandoned mines are not worth any further attention, there are portions of the parish untested as to their mineral character, and which deserve investigation. The land between Tingtang and Perranuthno and Stithians is "virgin ground," and extending from Treviskey Mine to near Bessow Bridge. Except a trifle done in Tresamble, near the Church town, a little adit cut by the late Mr. B. Sampson from near Treviskey southern gate into Devis estate, and a little working in South Clifford and Wheal St. Aubyn, all the ground is virgin. There is a piece of unexplored land between Wheal Damsel and Wheal Squire, east of Tingtang. There is also a large area of virgin ground between West Damsel and Carnmarth. In Penstrutal there is a large field for a justifiable appropriation of capital in testing the numerous lodes contained within that sett to my knowledge.

Instead of expending large sums of money in reopening deep mines, capitalists would do well to open lodes which have not been tried, except near the surface, where such lodes afford any reasonable chance of productiveness. The money required to resume workings in one deep mine would test a dozen fresh ones, with a stronger probability of success. The second working of most deep mines has resulted in considerable loss, but there may be some cases of an exceptional character warranting such resumption. If, for instance, a good mine were flooded through accident of some kind, like East Wheal Ro e was in 1846 or 1847, when 39 men were drowned. Another lead mine (the Tamar) was also flooded by the pressure of the tide, which filled the mine in a few minutes. Fortunately it happened on a Sunday, when no man was there. Had it happened on any other day perhaps a hundred lives would have been sacrificed. If lead had kept up to a high price, and it could have been found practicable to stop the hole, it would have been proper to do so, and resume the works, as I understand the mine was rich at the time of the accident. I suppose that the adventurers thought the thing impracticable. The miners worked too near the bed of the Tamar, and thus narrowly escaped death.

Truro, Feb. 15.

R. SYMONS.

EXHAUSTED MINES.

SIR,—By "exhausted mines" I do not mean that no mineral is left in them when they are abandoned, but that the yield is not nearly sufficient to pay the expenses of working them. There are copper and tin ores left in Treavean, Treviskey, Consols, Wheal Damsel, West Damsel, East Damsel, Wheal Buller, Wheal Basset, Wheal Maid, Poldice, Wheal Unity, North Downs, Godolphin, Wheal Vor, Wheal Fortune, Great Work, Wheal Alfred, Providence, Billeswidden, East Crinnis, and many others, which should be avoided by gentlemen seeking investment for capital, because I am sure that not one of them is worthy of a re-trial. Several of them have been re-tried already at a great sacrifice. But there are people in the world who, for a consideration, will recommend any mine to investors, as was the case in Godolphin, Wheal Vor, Wheal Alfred, and numerous others, which resulted in very serious losses—Wheal Vor, 350,000*l.*; Wheal Alfred, 80,000*l.* and 150,000*l.*; East Crinnis, 150,000*l.*; Godolphin, 150,000*l.*, and Wheal Towan, 80,000*l.* Who would be so insane as to reopen Fowey Consols, or Par Consols? and yet there are a few persons who think that Fowey Consols would pay.

I know of a mine unwrought below the adit, which is about 60 fms. deep; above which a considerable quantity of copper ore of good quality was raised, and the large "bunch" is continued under the adit. The late lessees intended to erect an engine to pump the water, and extract the ore, but their bankruptcy intervened, and the mine has been idle ever since. This is a mine that is sure to pay, and to yield profit almost at once after the machinery is set in motion. Capitalists, note this!

Truro, Feb. 17.

R. SYMONS.

MINING IN CARDIGANSHIRE.

SIR,—I have read with great pleasure the remarks of your correspondent, "Mallet," in last week's Journal. Nothing that I know of requires more care and skilful supervision than mining. When we consider the irregularity and peculiarities of all mineral deposits, and looking back to past failures—to instances where rich deposits have been missed and left standing perhaps within a few feet—when, too, we know that miners will (not unnaturally) select the easiest ground to drive in, it is not absurd to think that a mere hasty visit of even a skilled man is sufficient to successfully conduct a moderate sized mine? As to the class of managers your correspondent describes they are not only worthless but misleading. They listen to the highly spiced verbal report of the underground captain, and having rendered it into still more highly spiced English on paper, they depart. The public, believing in the wondrous riches promised, spend their money in many instances in places never worthy of a shilling outlay; and then with the inevitable failure comes a general disbelief in the whole district.

The time will, no doubt, eventually come when (as in the coal mines) every manager will have by an examination to prove himself competent to carry out a metalliferous mine. I do not say it is necessary for that purpose that a man should be able to write high-flown English in a copper-plate hand; but I do say that he ought to be able to dial and level, and in some sort of way, at all events, to draw a comprehensible plan—further, that he ought to know by experience the nature and indications of mineral deposits and the value of the labour required in the different descriptions of rock, whether driving, sinking, or stopping—the best way to find mineral, and the most economical way to take it away when found. There are men in this county who would in all these respects stand the test; but, on the other hand, we have many who are good scholars but no miners, and some who are good miners but no scholars. By all means let us have men who know a cross-cut from a cross-course and a shaft from a shovel.

Your other correspondent who refers to my remarks on the purchase of mines does not think quite agree with me; but I cannot but maintain that in purchasing a mine we ought surely to act as we would in any other investment, and look to the returns. Firstly, then—of course, these are only private views—every investor in mining enterprise ought to look for at least 10 per cent. for his money; secondly, and this is a sequence of the first, he ought, at all events, not to pay more than 10 years' purchase on the actual and assured returns. If these returns are only prospective he ought not to give five years' purchase. Let me suppose a case, which shall be purely imaginative.—The Llinkun Slide Mine. "This mine was worked centuries ago, and upwards of one million sterling was raised from it. (The probable outlay during that time cannot be arrived at, nor the profits.) The mine was abandoned some time back, owing to disputes amongst the proprietors (who could not agree who was to go on losing money). There is a full and ample plant of machinery on the mine (which was lately sold under an execution by the sheriff for 950*l.* 19*s.* 11*d.*). All that is required is further capital to develop the mine (perhaps), and lay open a lasting and remunerative property. (Yes, to the managers and merchants.) The purchase is 20,000*l.* (out of a capital of 30,000*l.* say), of which the vendors show their confidence (?) by taking half in shares."

Although this is quite a fiction there is not a mine manager in the country who would say he knew some concern it would suit. Here, where the vendors have spent (say) 2000*l.* or 3000*l.*, the public are to give 10,000*l.* in cash, which is dead outlay, and find 10,000*l.* for the working expenses, and then only get two-thirds of the profits; or say the vendors take the whole 20,000*l.* in shares, then the public find all the working capital to carry on the concern, and get one-third of the profits.

What I say is this (and I must cut my parable short) if a mine is as good as many vendors describe, and so certain to yield large returns, let the vendors' shares receive no dividends till the public have had (say) 5 per cent. on their hard cash, and then go equal shares afterwards; and, if you wish to be very liberal pay in cash a fair

valuation for the machinery. I say, in conclusion (and I will bring a tempest about my ears), that there is not a mine in Cardiganshire at the present moment worth more than 25,000*l.* in hard cash down, and I will leave it to your reporter for this part, and I do not know who he is, to say whether I am right or not. G. J. Feb. 18.

CAMBRIAN MINING COMPANY.

SIR,—From time to time there have appeared some of the most contemptible misstatements regarding this company. The directors have not considered it necessary to notice such remarks, but in the Journal of Feb. 15 it is stated that the mines now worked by this company were sold for 2000*l.* The directors beg to state that when they paid 70,000*l.* (in shares) for the same the mines were in active operation, and the great discovery of copper had been made, the value of which has since been proved by the sales of ore already made by this company. The directors request that you will insert this communication in contradiction to the falsehoods propagated by interested and unscrupulous individuals. GEO. H. KERNE, Managing Director.

London, Feb. 19.

PARYS MOUNTAIN, NORTH WALES.

SIR,—The valuable light now thrown upon the important position of the 90 south cross-cut being rapidly driven into the mountain, by an inspection of the Mona Mine by Captain Michell, amply verifies the remarks of your correspondents, that the success of this enterprise is of no ordinary character. Owning two-thirds of the sett as against one-third by the Mona Mine, and being the richest portion, as proved conclusively in the great open cast above, must recommend this property as a speculation perhaps unequalled in mining history. Ample capital being now found by the reconstruction as proposed at the very satisfactory meeting held last week, and the fact of the 90 being but 15 fms. from the goal of its ambition attaches additional prospective value to the property.

MINING ENGINEER.

KILLIFRETH MINING COMPANY.

SIR,—In a late Journal I notice your Scotch Correspondent (who seems a master of the subject), in his weekly report, says, "should tin rise a good deal, Killifreth also is a mine that will prove a prize." Your correspondent is undoubtedly correct; but what strikes me as singular is that at such a distance from the mining field the merits of Killifreth should be known and appreciated, while nearer home they are almost disregarded. Our Northern friends have proved themselves particularly sagacious in matters of this kind. A few years ago Tokenbury was being hawked in the London market without success; it was purchased in Glasgow, and, under the name of Glasgow Caradon, soon became a successful paying property. Tharsis could not find a purchaser in London; but at Glasgow a company was formed for purchasing it, and in less than two years became worth 40*l.* per share, to say nothing of dividends; and most mining men are familiar with the fact that when East Caradon were unsaleable in London at 5*s.* per share they were bought eagerly in Glasgow. They were soon selling at 50*l.* per share. Either by acute observation, or a perfect system of obtaining information, Scottish speculators would seem to have the advantage to an extent which does not obtain nearer home; and in selecting Killifreth by your Correspondent another instance is given of superior discrimination.—*York Buildings, Feb. 20.* CIVIL ENGINEER.

(For remainder of Original Correspondence, see to-day's Journal.)

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week business has continued very restricted, and no new feature has transpired, either in the money market, politically, or otherwise, of sufficient importance to give any decided tendency to prices. There is no alteration in the protracted depression of trade, and this causes rumours of commercial difficulties to be renewed. Regarding the share market, however, there is good reason to believe that prices of many securities are below even their present intrinsic value, and with intelligent discrimination investors might profitably direct their attention to picking up any such bargains.

In shares of coal and iron companies, Benhar have fluctuated between 12*s.* and 17*s.*, and at the end of the week stand at 15*s.* 6*d.* or 3*s.* 9*d.* per share higher. The meeting of creditors of this company, referred to below, passed off very satisfactorily, and it is pretty certain ways and means will be devised to overcome the present financial difficulties. Onos and Clelands have also advanced 6*s.* per share, being in request at 10*s.* The committee of investigation of this company have issued a rather encouraging report, which will be found below. It may be noticed a surplus of assets (taken at a liquidation value) is shown over liabilities of about 14,000*l.*; and as the company is in 15,000 shares, it follows each share is worth 18*s.* or 19*s.* at the worst. Nant-y-glo and Blaina (pref.) have fallen 4*s.* per share; Ebbw Vale, 10*s.*; and Marbella, 3*s.* The meeting of the Marbella company will be held on March 4. The numbers are published of the Leigh and Wilkes Barre 6 per cent. bonds drawn for repayment on May 1. Andrew Knowles and Sons are at 19*s.*; Bolokow, Vaughan, A. 10*s.* 6*d.* to 10*s.* prem.; Cardiff and Swansea, 15*s.* to 20*s.*; Chapel House, 46*s.*; Chillington, 37*s.* 6*d.* to 42*s.* 6*d.*; Charles Cammell and Co., 15*s.* 6*d.*; Ebb Vale, 67*s.* 6*d.* to 72*s.* 6*d.*; Great Western, 40*s.*; ditto (pref.), 80*s.*; and ditto (debt), 60*s.* Lydney and Wiggpool, 11*s.* Muntz's Metal, 55*s.* prem. Nant-y-glo and Blaina (pref.), 12 to 16. Newport Abercromb. 75*s.*; Pelsall, 10*s.* 4*d.*; Parkgate, 24*s.* 6*d.*; Rotherham, Masborough, and Holmes 6 per cent. (pref.), 80*s.*; Rhymney, 13; Sandwell Park, 14; Scottish Australian, 35*s.* to 35*s.*; Sheepbridge, 47*s.* 6*d.*; South Wales, 60*s.*; Staveley, A. 40*s.* 6*d.*; ditto, C. 61; and ditto, D. 10*s.* 4*d.*; Thorp's Gawber Hall, 35*s.* to 40*s.*; Tredegar, A. 14; Whitehaven Iron, 10.

In shares of foreign copper companies, Panollia have advanced 4*s.* per share, while Cape have fallen 10*s.*, and Tharsis 7*s.* 6*d.* Yorke Peninsula, pref., also lower, at 7*s.* 6*d.* to 10*s.* Tharsis have not been much dealt in, and from being 22*s.* 6*d.* buyers nominally are now 21*s.* English and Australian, 22*s.* 6*d.*; Rio Tinto, 5 per cent., 58*s.* 6*d.* to 59*s.* 6*d.*; and Yorke Peninsula, 2*s.* 6*d.* to 3*s.* 9*d.*

In shares of home mines, Glasgow Caradon are higher, at 16*s.* to 20*s.* Gunis-lake (Clitters) also wanted at 7*s.* 6*d.*, or perhaps more. There is an enquiry for Prince Patrick and Victor shares, but Medlyn Moor, Morfa Du, and North Hendre are all offered. Wheal Kitty (St. Agnes) shares firmer, although a call is expected at the meeting shortly. Lead mines generally are out of favour, as at the present price of pig-lead a number of them must wind up. The company referred to in last week's Journal as being formed to work a first-class lead property in Scotland, however, possesses special advantages which enable it to make large profits even in the present times, and it is going on. A prospectus will shortly be prepared, but it is likely to be so good a speculation that all the shares will be applied for very soon. Bampfyde are at 5*s.*; East Craven Moor, 10; Glyn and Van Consols, 8*s.* 9*d.*; Great Laxey, 14*s.* 6*d.* to 15*s.*; Mwyndy, 14*s.*; West Craven Moor, 9; and Wheal Gribor, 5*s.* to 7*s.* 6*d.*

In shares of gold and silver mines, Richmond are 3*s.* 6*d.* higher, at 9*s.*, having been firm all the week. This week's run is 87,000*l.* This mine has been paying great dividends of late years, and, according to all appearance, is a most valuable property; but investors must never dispense with great caution in buying shares of American mines, chiefly because it never seems possible to find out with any degree of certainty how long even the best of them is likely to continue profitable. The clean-up at the Original Amador Mine of the London and Californian Company in January has been estimated at 85500*l.* The profit in January at Sierra Buttes has been estimated at 24061*l.*, and at Pumas Eureka 21,313*l.* Chicago are at 2*s.* 9*d.* to 17*s.* 6*d.*; Colorado United, 17*s.*; Chontales, 3*s.*; Don Pedro, 3*s.* to 1*s.*; Eberhardt, 3*s.*; Eschquer, 4*s.*; Emma, 3*s.*; Flagstaff, 3*s.* to 3*s.*; Frontino, 2*s.*; Jervall, 4*s.* 6*d.*; Port Phillip, 10*s.* 6*d.*; Ressa Grande, 2*s.*; St. John del Rey, 2*s.*; South Aurora, 3*s.* to 4*s.*

Shares of oil companies have been in demand. Uphall and Young's Paraffin both 10*s.* per share higher. The next dividend of Young's Paraffin is expected by some to be a little less than last year's, perhaps about 15 per cent. Price's Patent Candle, 9*s.*; Runcorn Soap and Alkali, 9*s.* 6*d.* In shares of miscellaneous companies there is little alteration. The meeting of the Birmingham and Midland Counties Val de Travers Paving Company was held on Tuesday. Avonside Engine are at 6*s.* 6*d.* Cheshire Amalgamated Salt, 5 to 9*s.* Droitwich Salt, 22*s.* 6*d.* Earle's Shipbuilding, 23*s.* 6*d.* Liverpool Rubber, 60*s.* 6*d.* Native Guano, 60*s.* Phospho-Guano, 65*s.* to 67*s.* In shares of wagon companies the quotations are—Birmingham, 13*s.*; Bristol and South Wales, 6*s.*; Gloucester, 7*s.*; Metropolitan, 4*s.* 6*d.* Midland, 9*s.*; Railway Carriage, 70*s.*; Starbuck, 12*s.* 6*d.* and Swansea, 40*s.* Prices of chemical companies' shares are—Langdale's, 25*s.* to 25*s.*; Lawes, 8*s.* 6*d.* to 8*s.*; and Newcastle, 2*s.* to 22*s.* 6*d.*

OMOA AND CLELAND IRON AND COAL COMPANY (Limited).—The report of the committee appointed at the general meeting on Aug. 30 last is now issued. They state the only work at present going on is carrying through a communication between pits Nos. 40 and 43 on the Cleland estate. On the Windyedge estate pits 4 and 5 have both been shut up since July last, but being kept in good order can be resumed as soon as prices improve. The brickwork has also been closed, owing to the fall in prices, but is also ready to start on the shortest notice. Under the present severe and protracted depression of trade the joint efforts of the directors and committee were directed to reduce the fixed charges to a minimum, in which they have met with a large amount of success, as both the landlords have agreed to materially reduce the fixed rents during the suspension of works. After various negotiations with the Scottish Wagon Company, an agreement has been entered into whereby the future payments and arrears are consolidated into a new loan, having seven years to run from Oct. 1 last. Under this agreement the loan is to be repaid in quarterly instalments of 348*l.* 15*s.*, the first payment being due on Jan. 1, 1879. This operates as a considerable relief for the

only are the arrears got rid of, but the annual payment to the Wagon Company is reduced from 18500 to 13500.

A statement of the assets and liabilities of the company has been made up, in which the former are taken at what they would realise if forced on the market, and keeping out of account the value of the mineral leases, expenses of sinking pits, machinery, and fittings at pits &c., which have cost more than 30,000. The assets thus amount to 22,251, and the liabilities to 8362, thus showing a surplus of assets of 13,889. The committee do not recommend any additional capital to be raised at present, and they think as much as will be necessary when the works are resumed may be raised either by a cash credit with guarantee from the larger shareholders, by receiving such security as may be determined, or by a loan over the company's property, or by a sale of portion thereof. The balance at debit of revenue account, as at June 30 last, was 15,266, occasioned by losses in the French trade, &c., and they recommend this to be written off by reducing the shares on which it have been paid to 3s. per share paid nominally; and the balance of the revenue account they propose to apply to reduce the amount at credit of property account. A special meeting will be called and resolutions submitted to accomplish these objects in due time.

BENHAR COAL COMPANY (Limited).—A report has been issued by the board of directors appointed at the last meeting, and the gentlemen associated with them as committee of advice, with a view to give effect to carry on the business. Their concern is with the present position of the company, and its future administration. The affairs of so important an undertaking are necessarily intricate, and they have been rendered additionally so by recent complications. It is to be regretted that the gentlemen who have reported upon the mineral estates should not have coincided in their opinions as to their value; but the shareholders will probably be disposed to concur with the board and committee of advice that the last reports obtained by the directors from Messrs. Geddes and John R. Williamson, incurred in as they are by Mr. Aitken, himself a practical mining authority, and well acquainted, moreover, with the company's collieries, are entitled to every confidence. The report proceeds to discuss the question whether the company is now paying its way. Referring to the report of the accountants of the working for November and December, which was given a week or two since, they say it is confirmed by the company's commercial manager, and are satisfied the undertaking is realising substantial profits. In arriving at these profits the amount actually expended on general repairs has been fully charged; and while the average expenditure was probably less during the period, which difference would require to be deducted from the profits on the other hand, the company did not get full advantage of the recent reduction of wages. The next point considered in the report—Are there within the concern the elements of commercial soundness if the present financial embarrassments be overcome?—is a question the answer to which depends upon the accuracy of the estimates of the company's mineral resources.

According to the reports of Messrs. Geddes and Williamson, above referred to, the company does undoubtedly possess a valuable mineral estate, and it is only necessary to consider if it can be worked in average times at adequate profits. Taking into account the capital profits ascertained for the last two months, notwithstanding the present depressed state of trade, there seems good prospects of the company being successfully carried on under judicious management. The accountants' report showed the total liabilities at Oct. 31 last was 241,121. In addition to this a sum will fall to be provided annually to meet wagon payments on account of capital. But the amount actually required to discharge actions in Court, pay pressing debts, and take the company out of liquidation, is much smaller than this. The debenture holders, all are favourable to delay 18,183, and even of this only 5235 is past due. Of the general creditors, out of 124,124, all have agreed to delay except 10,868, while the landlords will either take preference shares for their claims, or be content with their security of hypothec. Thus 16,000, is all that is required immediately. If the oil and brick works and estate of Duddingston were disposed of the shareholders would be left in possession of their mineral property, houses, and railways in good working order to earn a dividend.

At the meeting of creditors of this company on Tuesday the provisional liquidator read a statement, which showed that since his appointment (Dec. 15) the receipts over expenditure amounted to 5100, and that the floating capital of the company had recovered itself to the extent of between 11,000 and 12,000. A resolution was unanimously agreed to that it was in the general interest of the creditors that the Court should exercise the powers conferred on it by statute to prevent interruption to the business of the company by diligences till May 3, so as to enable the new directors to continue their efforts to raise additional capital, and to make arrangements with creditors. It was stated that of the 100,000 of preference stock about 200 parties had already applied for in all 6559 shares, or equal to 37,955, and creditors had agreed to take 827 shares in lieu of debts amounting to 4135. A gentleman who represented the National Bank of Scotland stated they did not entertain any great doubt that if the concern was lightened of its too heavy burden of oil and brick works, heritable property, &c., which had nothing to do with coal mining, it would succeed if properly handled, and they entertained no doubt that it would be so, all of which is very encouraging.

KILLBERRIE MINE.—At the meeting on February 7 the agent's report showed the prospects had greatly improved. They say the outlook is considerably better than for some years, and in a very short time it will be a profitable mine. The engine-shaft is sunk 10 fathoms below the 70 ft. level. Within the last 9 feet sinking the tin lode has again come in the shaft, and in the last 2 ft. sinking the copper lode has also dropped in the shaft from the north, and formed a junction with the tin lode, the effects from which, so far as seen (about 4 feet in length, and 2½ feet wide), are very cheering indeed, the lode being now worth for tin 15s. per ton, and for copper every penny of further improvement. In 10 ft. level a very great improvement is also expected in a fathom or two more driving.

Per share.	Paid up.	Rate per cent.	Description of shares.	Last price.
4	10	25	COAL, IRON, STEEL.	
4	10	25	Arnstons Coal (Limited)	90s.
10	10	10	Benhar Coal (Limited)	15s. 6d.
100	10	65	Bolokow, Vaughan, and Co. (Lim.)	54½
10	10	10	Chillingham Gas Co. (Limited)	6s.
10	10	10	Chillingham Iron (Limited)	42s. 6d.
10	10	10	Clyde Coal (Limited)	40s.
23	20	10s	Edw. Vale Steel, Iron, and Coal (Lim.) ..	70s.
10	10	7	Fife Coal (Limited)	75s.
10	10	10	Glasgow Port & Warehouse Iron & Coal (L.)	40s.
10	10	10	Ditto Prepaid	35s.
10	10	10	Lochore and Caplethrae (Limited)	40s.
10	10	10	Marbella Iron Ore (Limited)	22s.
10	10	10	Monkland Iron and Coal (Limited)	16s.
10	10	10	Ditto Guaranteed Preference	13s.
100	100	10	Nan. pref. Gt. & Blains Ironworks	6s.
1	6	10	Omoa & Cleland Iron & Coal (L. & Red.) ..	10s.
1	10	15	Scottish Australian Mining (Lim.)	32s. 6d.
1	10	15	Ditto New	15s.
Stock	100	100	Shotts Iron	60
			COPPER, SULPHUR, TIN.	
4	4	4	Canadian Copper and Sulphur (Lim.)	5s.
10	7	7s 6d	Cape Copper (Limited)	29
1	1	7s 6d	Glasgow Caradon Copper Mining (Lim.) ..	16s.
1	15s	7s 6d	Ditto New	13s. 6d.
10	9s	10	Huntington Copper and Sulphur (L.)	12s. 6d.
4	4	4	Panellio Copper (Limited)	25s.
10	10	6	Rio Tinto (Limited)	52s. 6d.
20	20	7	Ditto 7 per cent. Mortgage	13s.
100	100	5	Do. 5 p.c. Mor. Deb. (Sp. Con. Bds.)	21s.
10	10	20	Thariss Copper and Sulphur (Lim.)	21s.
10	7	20	Ditto New	14s.
1	1	1	York Peninsula Mining (Limited)	8s.
1	1	1	Ditto, 15 p.c. Guaranteed Pref.	10s.
			GOLD, SILVER.	
1	1	1	Australian Mines Investment (Lim.)	5s.
5	5	30s.	Richmond Mining (Limited)	9½
			OIL.	
10	7	5	Dalmen Oil (Limited)	6½
1	1	25	Oakbank Oil (Limited)	3s.
1	5s.	15	Ditto	11s.
10	10	7½	Uphall Mineral Oil (Limited) "A"	6½
10	10	8½	Ditto "B" Deferred	10
10	8½	17½	Young's Paraffin Light & Mineral Oil (L.)	14½
			MISCELLANEOUS.	
50	25	5	London & Glasgow Engineering & Iron Shipbuilding (Limited)	21
7	7	10	Phospho Guano (Limited)	61½ 6d.
10	10	8	Scottish Wagon (Limited)	9
10	10	8	Ditto New	75s.
			Interim 1 Per share	For six months of 1878

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.
Post Office Buildings, Stirling, February 20.

THE BOILER INSURANCE AND STEAM POWER COMPANY (Limited).—The chief engineer's report, to be presented to the annual meeting, states that there was a continued increase of business in 1878, though less than in 1877. On the subject of explosions the report says:—"The number recorded during the past twelve months is slightly over the average, but although the destruction of property has in some cases been great, it is satisfactory to observe that the number of deaths resulting from these explosions is smaller than for many years past, and considerably below the average." The causes of explosion are thus stated:—Corrosion of plates 14, causing loss of 23 lives; over-pressure 9, 6 lives lost; frost 6, 1 life lost; malconstruction—deficiency of stays 4, 1 life lost; fracture of plates 3, no lives lost; overheating from deficiency of water 2, 5 lives lost; ditto from deposit 1, no lives lost; collapse of flue from deficiency of water 7, 6 lives lost; corrosion of plates 3, 4 lives lost; overpressure 2, 3 lives; cause not ascertained 1. Total 52, 49 lives. During the year two insured boilers exploded. This company, the oldest Boiler Insurance Company in existence, has now completed its twentieth year, and since its establishment in the beginning of the year 1859, no less than 37,191 boilers have been insured by it, in addition to

which about 11,000 boilers have been inspected upon which no insurance has been effected. The average annual rate of explosion among the insured boilers up to the end of the year 1878 has been one in 5197, which is lower than the year 1871.

Meetings of Public Companies.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The ordinary general meeting of the proprietors was held at the Cannon-street Hotel, on Thursday.

Mr. R. A. ROUTH, the chairman, presiding.
Mr. C. B. ROGERS (secretary) read the notice calling the meeting. The report of the directors was taken as read.

The CHAIRMAN said that on the present occasion he had the honour to present to the shareholders the 23rd annual report, and before proposing the formal resolution for its adoption he would make a few observations. One of the principal things they had to look at was the supply of ore, and they would find that notwithstanding a great number of mines in the York Peninsula had ceased to raise ore in consequence of the low price of the price, during the past year this company had had a very fair amount of ore to deal with. During the period under review the quantity of ore raised had been 16,194 tons, as against 13,552 tons in the previous year. During that period also the quantity which they had smelted at Port Adelaide had been 5780 tons, against 6183 tons; the quantity smelted at the Newcastle Smelting Works had been 9098 tons, against 7341 tons; the quantity of copper made at the Port Adelaide Works had been 1167 tons, as against 1553 tons; and the quantity of copper made at the Newcastle Works had been 1457 tons, against 1330 tons. Therefore, with regard to copper, they had had a very ample supply. The profits of the company this year had been affected by a variety of things. First—and it was a hackneyed phrase—they had had great depression of trade. Again, the fluctuations in the price of copper had been considerable. The price of copper, which in January, 1878, stood at 74s. per ton, had now reached the low price of 64s. per ton. Therefore, the shareholders would naturally suppose that the directors had had great practical difficulty in dealing with stocks in the period under review. He mentioned that to show it would be impossible for anyone to make large profits during a period which commenced in January and continued throughout the year. He would read an extract from a circular from the firm of Messrs. Rogers, Sons, and Co., which would corroborate what he had stated:—

"This metal shows a reduction of 20 per cent. in value as compared with prices at the commencement of 1878. A continuous fall went on throughout the year, the reaction being only on two occasions, and those of a momentary and merely nominal description. The imports in the year decreased nearly 4000 tons, and the exports increased about 5000 tons, while the stocks of all description show an increase of some 10,000 tons, thereby demonstrating that the constant reduction in the price of raw material has had a most depressing effect upon consumers, who practically hold 20,000 tons less copper than is usual with them. This state of things has been apparent throughout the year, all business being of the hand-to-mouth order; notwithstanding the Birmingham district was fairly employed. Consumers, however, have done well to reduce their stocks, seeing that copper has receded so much in value; 55s. for Chili bars must, however, be a safer basis to stock upon, and if, as is so confidently believed on all sides, production at present prices will materially fall off, copper may again become a very good investment, and the reintroduction of some of the capital formerly employed in copper would soon alter its value."

He would also read an extract from the circular of Messrs. Rickards. "The depression in the copper market continues, and in the absence of demand for manufactured from the ordinary centres of consumption, prices still tend downwards. It is evident there is more copper than the world at present is able to consume. The causes of this stagnation are many, prominent among them being the mistake made in the great time of inflation in 1873, when instead of saving the extra profits they realised, to serve in times of depression, many manufacturers put them into new works, and many of the merchants and working classes into new forms of personal expenditure. The consequence is that over production has brought on a collapse which there are few savings to meet. A continuance of low prices will bring things round again in time, by limiting production, and enforcing saving habits all the world over."

All this pointed to the same thing—namely that the quantity of copper produced had been in excess of the consumption; it also pointed to the fact that the volume of trade was lessening, whereas the supplies to the various manufacturers of the metal had not in the least way lessened, and the consequence was that prices had fallen. In addition there had been strikes and other causes. But, independent of that, it was clear that the supply exceeded the demand, and when this was the case it stood to reason that prices must fall. If the prices remained the same as in January, instead of paying a dividend of 1s. per share they would now be able to pay a dividend of 2s. 6d. or 3s. per share. Looking at all the circumstances of the case he thought the directors might fairly congratulate the shareholders that they had done so well as they had done, seeing that they had had to deal with a falling market from the beginning to the end of the year. The profit which was shown to "say affected by the valuation of stocks by the manager on the other side. Looking at the low price of copper here, he thought it necessary to take off from the fixed value rather more than 3000, the stock being valued on the other side at 60s. per ton, which made, as he had said, a difference of over 3000, in the amount paid to the credit of the company. This, of course, was so much dead stock on the other side; and if things got better, as they must do one day, then the company would get the benefit of that reduction in the valuation at some future time. In the meantime the directors thought it their duty to write down that stock to the lowest possible figure. As regarded future prospects, he could only say that if they could tide over, as they had done, four years of great depression, they might fairly look forward to much better results when better times came. He had had the pleasure of meeting the shareholders when they had divided 20,000, and 30,000, per annum, and he hoped that time would come again. In the meantime they were in a strong position; and he had got to the bottom of the market, and this company could manufacture as cheaply as anybody else, and he was satisfied the position of the company was sound in every respect. As regarded the subject of supplies, although some mines had gone out of work in consequence of the low price of copper prevailing, still the slightest move would bring supplies into the market. The agent, on the other side, who was a keen man, had found large quantities of ore in Xoumes, which had supplied this company for two or three years. He had also got shipments from New Zealand, and there were now about 50 tons on their way to the works. The company would have a very good supply of ore for the year ensuing; and, therefore, with a good supply of ore, and smelting reduced to the lowest possible cost, he saw no reason why they should not make a fair profit, especially if the price of copper had anything like the elements of life. There must be a bottom to all wells, and he thought they had got to the bottom of the price of copper; but supposing that were not the case, the company's purchases of ore had been made at the lowest price; and, therefore, he (the Chairman) thought at all events that there were one or two encouraging things looking in the future: one was with regard to the Northern Mines. He had recently spoken with a gentleman from Australia who was acquainted with the Northern Mines, who stated that the supplies from the Northern Mines were inexhaustible as soon as they could be brought down by railway, as copper was cropping out in all directions, and there was no limit to the supply. With regard to the railway to the North, the money for it had been subscribed and the railway had been commenced, and the first length of 200 miles was being made from Port Augusta at the small cost of 6s. per mile. The credit of the colony was exceedingly good, and the whole of the capital was subscribed, and it was believed that the line would be completed in about three years' time, but even supposing that only a portion of the line was opened they could send down ore by the completed portion of the line. Nothing but the want of carriage had prevented the ores coming down in large quantities. This company had already obtained land at Port Augusta, and they had the works at Port Adelaide, and he believed that they would see a more wonderful change in this company when the Northern Mines were opened up, for instead of having to look right and left to purchase ores with considerable difficulty, they would have the ores brought to them in any quantity they required. (Cheers.)

As regarded the political outlook, when they met last year they had the trouble

and anxiety of the Eastern Question and the Eastern war. That had now been settled. Since then they had had the Afghan war, and also the Zulu war, which was not likely to affect the commerce of this country. Therefore, the country might now be said to be practically at peace, and he did not see any reason why the trade of England, which had never languished long, and never in his recollection so long as now—should not again revive, and when revival took place this company was in a strong position to take advantage of it. (Hear, hear.) He saw signs of vitality in the copper trade itself. He had carefully watched that trade, consumers had divested themselves of stocks which they ought to have held, and they must replace those stocks, and when that took place the price of copper must rise. Last year Mr. Edwards, who was called the "Copper King," died; he had about 10,000 tons of ore and copper, a great portion of which was thrown upon the market, which, no doubt, had a considerable influence upon prices. He was happy to say the company was sound in every respect financially; the dividend, small as it was, had been fairly earned, and he wished it was a larger amount, but it was impossible to do more than they could; and he thought that, under all the circumstances, he might fairly congratulate the shareholders on the position of the company. (Cheers.) He moved the adoption of the report and accounts.

Mr. ALFRED CORBETT, deputy chairman, seconded the resolution.

In answer to Mr. ROBINSON, the CHAIRMAN said the copper in stock was valued at 64s. per ton, which was the lowest price.

Mr. ROBINSON asked whether the 2000, which had been taken from reserve should not be replaced before any dividend was declared?

The CHAIRMAN replied the reserve fund had sometimes been added to and sometimes taken from; at the present moment that fund stood at 10,000, on this side and 3000, in Australia; and as the profit had been fairly earned, and as the function of a reserve fund was to assist in the equalisation of dividends, he thought the directors would meet with the approval of the shareholders in paying the small dividend of 1s. per share. (Hear, hear.)

The resolution was then put, and carried.

On the motion of the CHAIRMAN, seconded by Mr. SPENCER HERAPATH, a dividend of 1s. per share was declared, payable on and after March 1.

The CHAIRMAN proposed the re-election of Mr. Alfred Corbett as a director, adding that gentleman had been a director from the commencement, and had rendered most valuable services to the company.—Mr. SPENCER HERAPATH seconded the resolution, which was put, and carried.

Mr. A. CORBETT acknowledged his re-election, and said that as he was a considerable holder of shares he had a personal interest in making the company successful.

The CHAIRMAN then proposed the re-election of the Rt. Hon. G. C. Bentinck, M.P., as a director, and added that that gentleman also gave great personal attention to the company's affairs.

The resolution was seconded by a SHAREHOLDER, and carried.

The auditor, Mr. John Viney, was re-elected; and a cordial vote of thanks to the Chairman and directors closed the proceedings.

SOUTH CARADON MINING COMPANY.

At a general meeting of shareholders, held at the mine on Tuesday (Mr. R. KITOW in the chair), the accounts for tenth, eleventh, and twelfth months showed a profit of 1587. 7s. 2d., and the balance of 2691. 2s. was carried to the credit of next account. The following report was read:—

Feb. 18.—I am pleased to say the mine is still looking well, and we think our discoveries to be equal to the returns. We have no reason to doubt its continuance. The machinery throughout the mine is in good working order, and the pumping power sufficient to keep it properly drained without being unduly driven. It will be seen from the statement of accounts that it is solely in consequence of the low price realised for our ores we are unable to declare a dividend.—J. HOLMAN.

HALKYN DISTRICT MINES DRAINAGE COMPANY.

The half-yearly meeting of the shareholders was held at the company's offices at Caerster, on Thursday, when the subjoined report of Messrs. John Taylor and Sons was submitted:—

The work in the deep level have been carried on since the general meeting held on Aug. 21 last without material interruption, and a further considerable increase effected in the rate of progress. During that period the level has been driven 443 yards, the average speed being 74 yards per month, and the greatest advance made being in the month of January, when the distance driven was 87 yards. Continued experience of the working of the rock drilling machines, by the aid of which this result has been obtained, confirms the high opinion we have before expressed of their superiority to other machines for the purpose this company has especially in view—the drive of a tunnel through hard rock at the highest possible speed. The level has now been extended since the commencement of the company's operations 751 yards. The value for upwards of 200 yards in length has been found to contain lead ore in fair quantities, and at one point produced as much as 2½ tons per fathom.

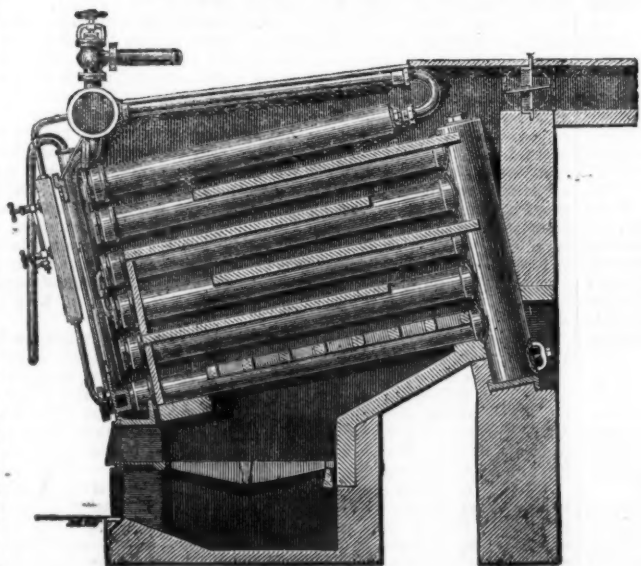
The appearance of the vein throughout has been more promising in the roof than in the bottom of the level, which leads us to believe that we have passed under a deposit of ore of considerable length and richness. A commencement has been made to work upon the vein from the point at which it was found to be most productive, and should it prove as rich above as it was found to be in the level itself regular returns of ore may very shortly be looked for. Several streams of water have been tapped at different points, but none of any importance, and the ground in the present forefront of the level is perfectly dry. The work of arching the old level with brickwork, under contract No. 2, and of removing the sand and mud which had accumulated is completed, and the level is now secured, and in good condition throughout.—JOHN TAYLOR AND SONS.

NEW MINING PUMP.—The concussion considered to be almost inseparable from direct-acting pumps used for draining mines is claimed to have been entirely remedied in the Deane pumps, now being introduced in America by Messrs. PARKER and LACY, of San Francisco. The plunger pumps have two plungers working in opposite ends of a water cylinder, divided in the centre with valves of the most approved construction. They are intended for situations where the gritty nature of the water prevents the use of the piston pumps. The piston mining pumps are made from special patterns, and are designed for situations where the water is comparatively free from grit. They are also desirable for temporary work, and for duty where space is limited. They are lighter, more compact, and cost less than plunger pumps of equal capacities. The linings, water valve plates, piston rods, stuffing boxes, and water piston-heads are of solid composition. The packing is of fibrous rings, or leather cups, as desired. They run without shock or concussion. The working parts are all readily accessible.

ANOTHER CURE OF INFLAMMATION OF THE THROAT, COUGHS, &c. (THIS WEEK).—Mr. Heron, 10, Arthur-street, Belfast, writes:—Dr. Locock's Pulmonic waters allayed the inflammation of my throat, relieved the cough, and gave me ease at once. They taste pleasantly. Price 1s. 16d. and 2s. 6d. per box.

HOLLOWAY'S PILLS—WEAK AND DEBILITATED CONSTITUTIONS.—The present weather is trying to the robust; to the weak and debilitated it is overpowering. Holloway's pills have long been noted for their corrective and purifying powers, and are the readiest restoratives of health and vigour. They remove all impurities from the blood, improve the digestion, and rouse the liver, without interrupting pleasure, business, or study. Holloway's pills cool the system, regulate the circulation, moderate excessive perspiration, guard the constitution in critical moments, and save it from destruction; in fact, so build up and renovate failing health as to make them the most desirable medicine. They neither grip nor act violently or inconveniently on the most delicate bowels, and may, therefore, be taken by the aged or infirm, and safely administered in the nursery.

BARROW SECTIONAL BOILER.



THE BARROW SHIPBUILDING COMPANY beg to call the particular attention of Steam Users to the great advantages to be obtained by adopting their Improved Sectional Boilers. After the most careful experiments extending over some years, and having worked these Boilers in their own workshops under the most varying conditions, and subject to the most crucial tests, they have every confidence in recommending them to the public.

The Boilers are constructed of the very best material, combined with the most careful workmanship, every Boiler being tested to 300 lbs. per square inch, and made absolutely tight and perfect before leaving the company's works.

Each Boiler, in addition, is sold with the certificate of the Inspecting Engineer of one of the first Boiler Insurance Companies in the country.

For particulars, apply to the—

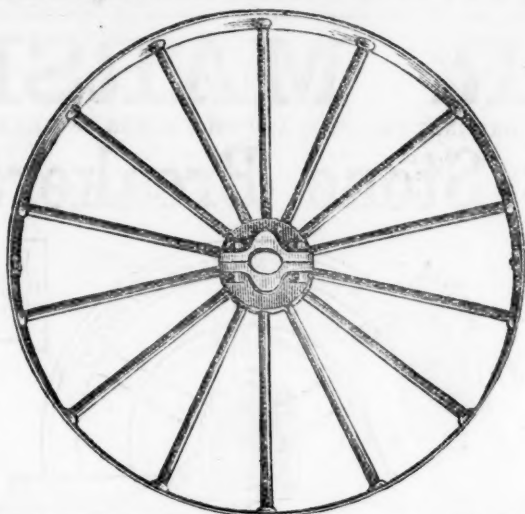
BARROW SHIPBUILDING CO.
(LIMITED),
BARROW-IN-FURNESS.

BELTING versus GEARING.

Of late years a great change has been gradually taking place in the Mills and Manufactories of Lancashire and Yorkshire by the substitution, betwixt the Engines and Shafting, of Belting for Gearing, thus doing away with all noise and vibration, as well as wonderfully reducing the cost of repairs; and so manifest are its advantages, that driving by Gearing will soon be the exception.

As a still greater improvement, we beg to submit our Wrought-iron Drums (Rodgers's Patent), of which we are the Sole Makers. Their special merits may be briefly stated as follows:—

- 1.—These drums absorb less of the power of the engine in friction than any other mode of driving.
- 2.—Leather belts on these drums will drive considerably more than cast-iron ones, and the belts last much longer.
- 3.—These drums are not only considerably lighter in the larger sizes, but also infinitely stronger than cast-iron ones.
- 4.—In case of fire they suffer little damage. We have repaired many hundreds that have been in very serious fires, generally at about 25 per cent. on first cost.
- 5.—For MAIN DRIVING purposes they are invaluable, especially in case of a new mill, as they do not require such substantial and heavy building construction as is necessary in ordinary cases to withstand the constant vibration of gearing.



6.—The wrought-iron drums and belts are more easily and quickly fixed than gearing.

7.—Greater economy in steam power, as it requires less power to transmit the same effective force with belts than it does with gearing.

8.—Very much greater economy in subsequent repairs, as compared with gearing.

9.—The power is transmitted evenly, faithfully, and noiselessly, and without the vibration arising from defective or worn gearing.

10.—They require no cases for transport or shipment.

In support of the foregoing statements, we may say we have already supplied upwards of 20,000 of these Drums for use in Great Britain and Ireland, and have also exported them largely throughout the Continent of Europe, India, and the British Colonies.

These Drums being made by special machinery, can be made any diameter up to 24 feet, and also any width up to 4 feet, and to fit any size of shaft.

FOR PRICES OF RODGERS' PATENT WROUGHT-IRON DRUMS, APPLY TO
HUDSWELL, CLARKE, AND RODGERS, RAILWAY FOUNDRY, LEEDS, ENGLAND.

Awarded Gold Medal, Paris Exhibition, 1878.

HADFIELD'S STEEL FOUNDRY COMPANY.

FIRST PRIZE MEDALS AT LEEDS, MANCHESTER, AND
WREXHAM EXHIBITIONS, 1875 AND 1878.

ATTERCLIFFE, SHEFFIELD,

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

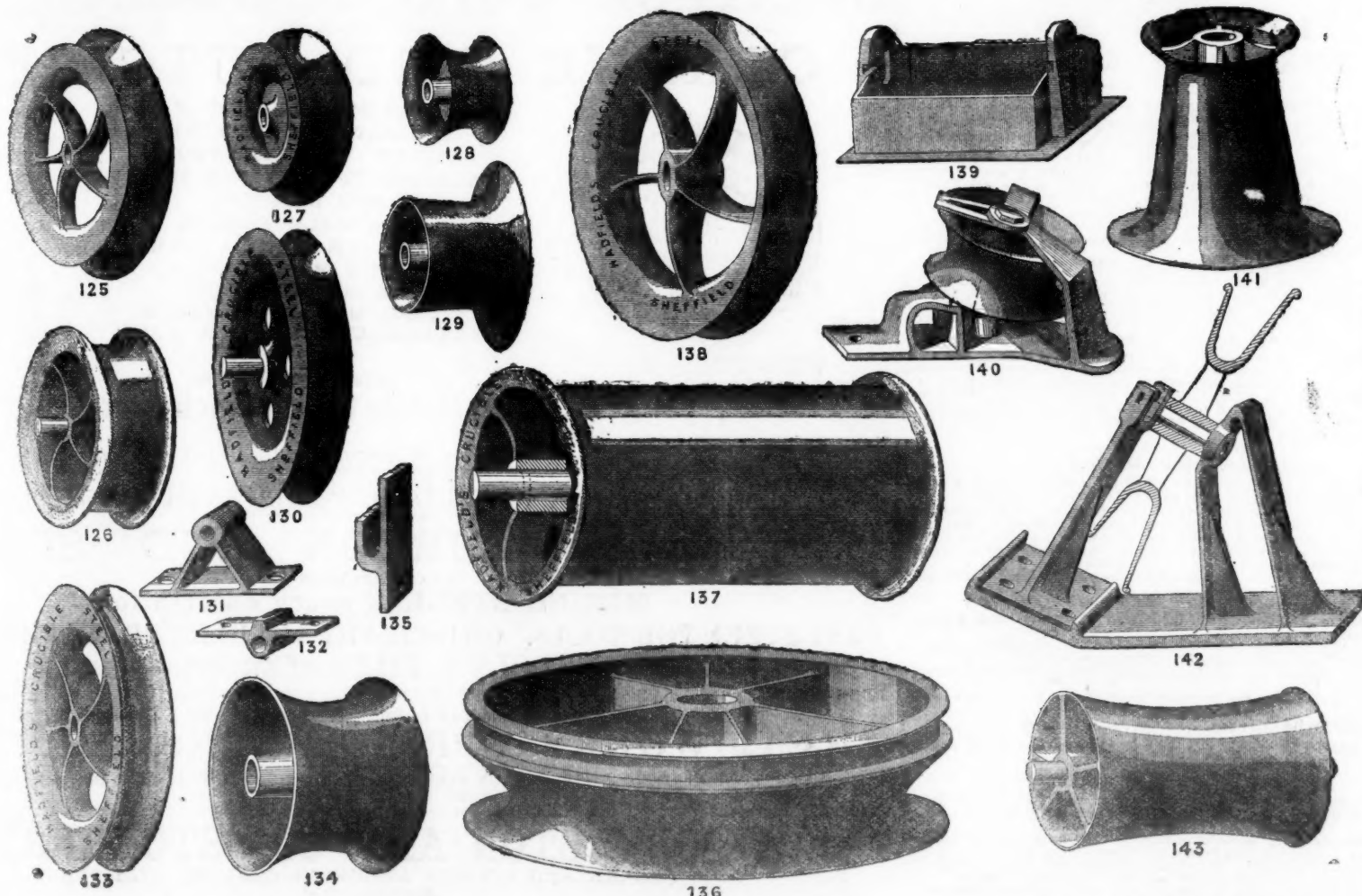
CRUCIBLE STEEL CASTINGS,

FOR

Engineering & Mining Purposes,

AND ARE THE SOLE MAKERS OF

Hadfield's Steel Rollers and Pulleys.



This Advertisement is varied from time to time.

[This Sheet of Drawings is Copyright.]

The following are some of the advantages claimed by the above Rollers and Pulleys:—

- 1.—LIGHTNESS.—They are cast by us from one-third to one-half lighter than cast-iron.
- 2.—SAVING OF HAULAGE POWER AND WIRE ROPES.—Our Pulleys and Rollers, being extremely light, they effect a great saving in haulage power, and considerably prolong the life of wire ropes. As our Rollers and Pulleys are equally balanced, and never lob-sided, the instant the rope or chain touches they readily revolve, and all grinding or sawing by the rope is avoided.
- 3.—STRENGTH.—Although extremely light they cannot be broken by ordinary means—say by the sudden passing of chains over them such as frequently connect the rope to the wagon, or hang loose from the end of the passing wagons.
- 4.—DURABILITY.—One of our Crucible Steel Rollers or Pulleys will outlast about TWELVE IRON ONES.
- 5.—They reduce wear and tear to a minimum, and are a great saving in working expenses.

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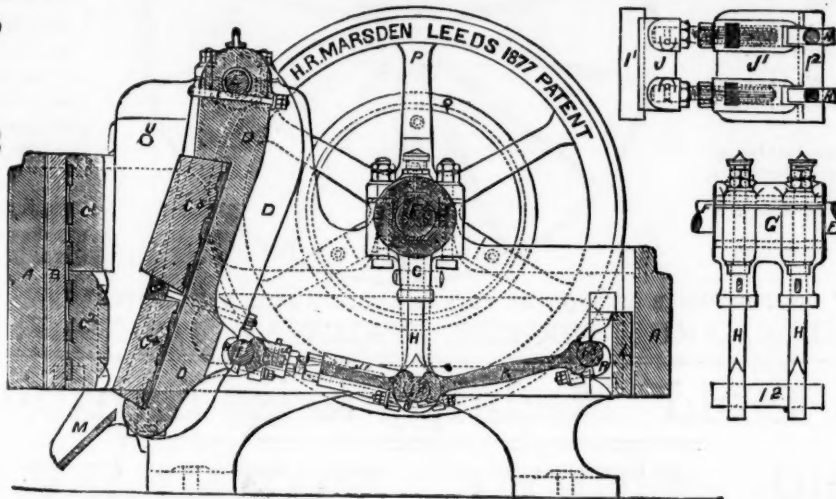
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70

PRIZE MEDALS.



READ THIS—

Wharfedale Lime Works, Maryport, Whitehaven,

November 7, 1878.

H. E. MARSDEN, Esq., Soho Foundry, Leeds.
DEAR SIR,—The machine I have in use is one of the large size, 24 in. by 12 in. The quantity we are breaking daily with this one machine is 250 tons, the jaw being set to break to a size of 2½ in. We have, however, frequently broken over 300 tons per day of ten hours, and on several occasions over 350 tons during the same period. The stone we break is the blue mountain limestone, and is used as a flux in the various ironworks in this district. We have now had this machine in daily use for over two years without repairs of any kind, and have never had occasion to complain of any inconvenience in using the machine. I hope the one you are now making for me may do its work equally well. The cost—including engine-power, COALS, ENGINEMAN, FEEDING, and all EXPENSES OF EVERY KIND—is just 3d. per ton. Should any of your friends feel desirous of seeing one of your machines at work, I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,

WILLIAM MILLER.

AND THIS—

Wharfedale Lime Works, Aspatia, Cumberland,

July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.
DEAR SIR,—We are in receipt of your letter of 4th inst. I may just state that the stone breaker above named has been under my personal superintendence since its erection, and I have no hesitation in saying that it is as good now as it was five years ago.

I am, dear Sir, yours faithfully,

FRANCIS GOULD.

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In ordinary ends two machines may be worked together, and at a proportionately increased speed. They are strong, light, and simple, easily worked, and adapted for ends and stopes, and the sinking of winzes and shafts.

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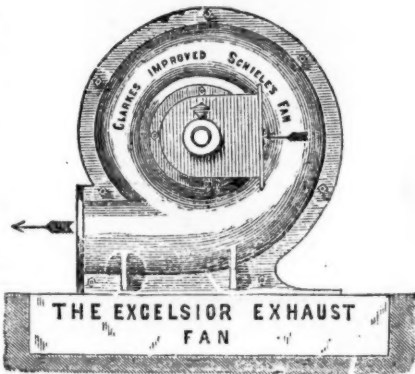
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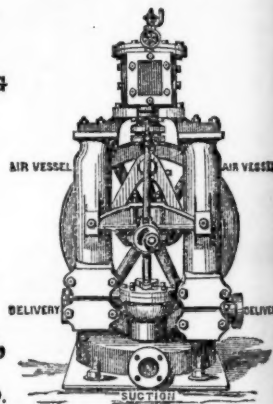


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